

# HANDBOOK OF THE BIRDS OF THE WORLD

Edited by

*Josep del Hoyo*

*Andrew Elliott*

*David Christie*

Volume 12

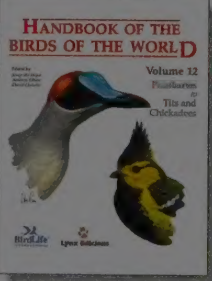
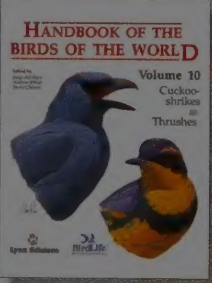
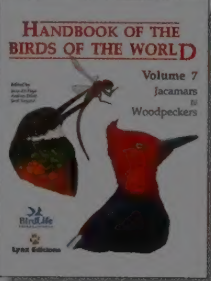
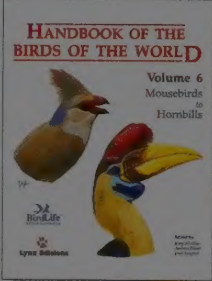
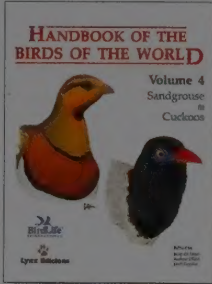
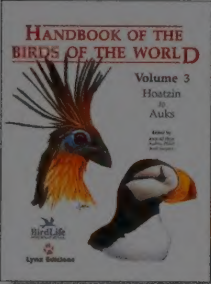
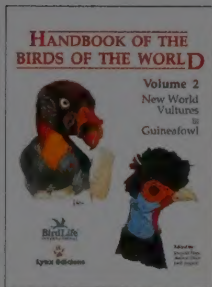
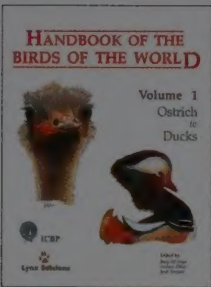
Picathartes  
*to*

Tits and  
Chickadees



  
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BRITISH BIRDS

Jacket illustration by CHRIS ROSE  
Grey-necked Picathartes (*Picathartes oreas*)  
Yellow-cheeked Tit (*Parus spilonotus*)









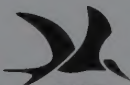
# HANDBOOK OF THE BIRDS OF THE WORLD

## Volume 12

Picathartes *to* Tits and Chickadees



**Lynx Edicions**



**BirdLife**<sup>®</sup>  
INTERNATIONAL





# HANDBOOK OF THE BIRDS OF THE WORLD

## Volume 12

*Picathartes to Tits and Chickadees*

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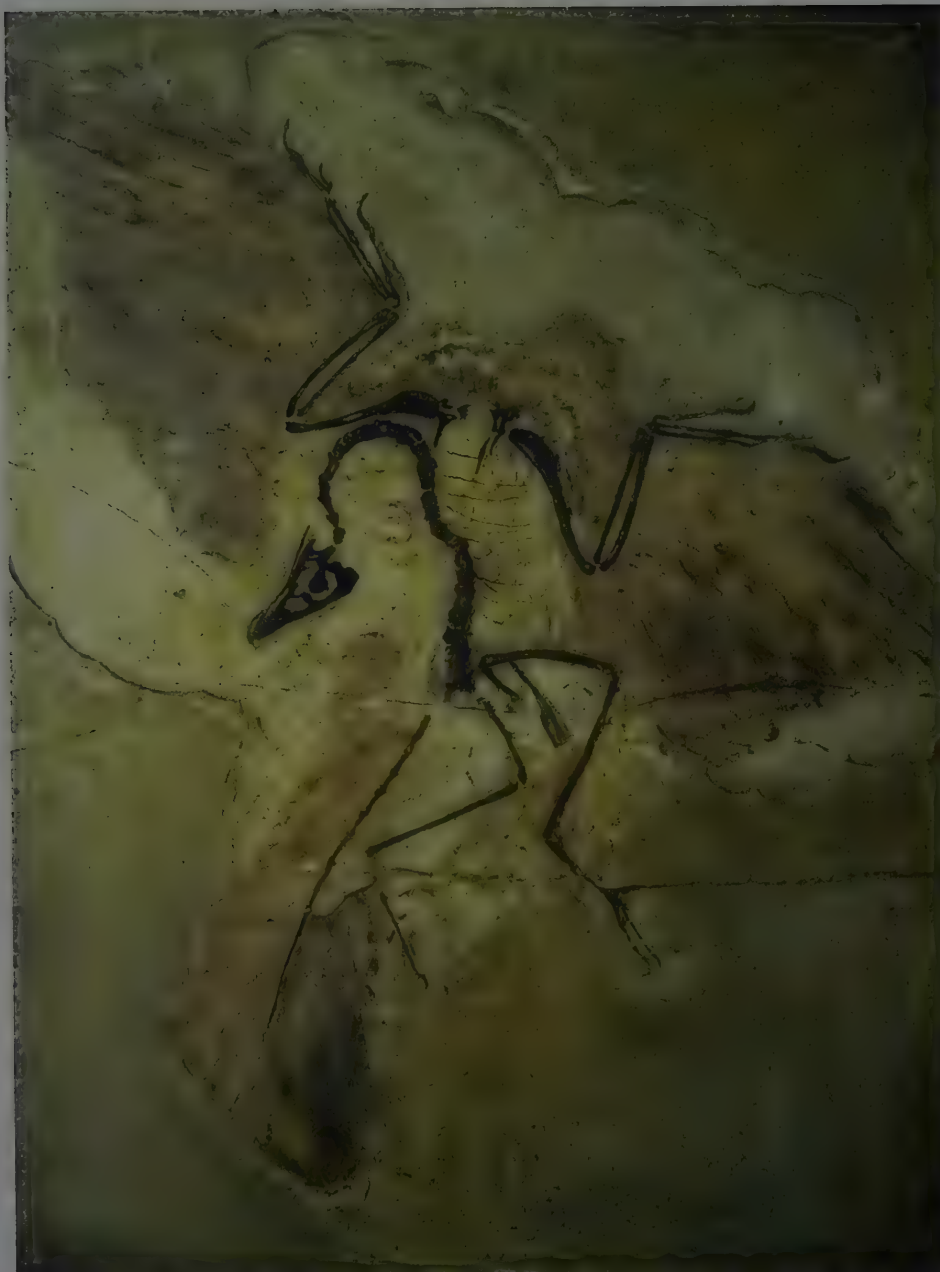
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*Archaeopteryx* is the archetypal 'primordial bird' of the Late Jurassic. This photograph shows the Berlin specimen, found in 1877, one of ten fossils that constitute all the known remains of the Solnhofen Archaeopterygidae. There has been debate as to whether the remains represent a growth series of a single species (as discussed in Chiappe & Dyke 2006) or constitute several different species, or even genera, within the family Archaeopterygidae (Elzanowski 2001, 2002).

## Foreword

## Fossil Birds

### Introduction

Today, there are estimated to be some 9800 species of birds on Planet Earth. This is only a window on the evolution of the class Aves. With those known in the fossil record, it can be increased to about 12,000 species, though about a third of these fossil species come from unknown lineages. Pierce Brodkorb estimated in 1959 that about 1,634,000 species of bird had existed over the 150 million years of avian evolution. We therefore know of well under 1%. However, our understanding of bird evolution is improving, particularly with the discovery of such fossil-rich sites as the Cretaceous deposits of northern China and the early Tertiary deposits of the Messel and Quercy, in Europe, and the Green River Formation of Wyoming, North America, while fossil collecting in other areas, such as Australia, has added to our knowledge of the diversity of the birds that once existed. What follows is a very brief summary of avian diversity, starting with the basal Urvögel, moving through the early Pygostylia and other non-carinate species, before ending with a broad survey of the modern birds—the Neornithes—which include all the bird species alive today.

Before beginning, special mention should perhaps be made of certain fossils that are regarded as contentious. Of particular significance is one such fossil, *Protoavis texensis*, as this species was hailed by its discoverer to be the primordial bird (Chatterjee 1994, 1995). Originating in the Triassic, it would have knocked the most famous of all basal birds, *Archaeopteryx*, off its pedestal as the oldest bird, predating it by over 100 million years. However, severe doubt has been cast as to its avian status, with indications that it is actually an early coelurosaur—just as significant palaeontologically, but not as a bird (Witmer 2002). *Archaeopteryx* is still holding onto its title of ‘the oldest fossil bird’—for now.

Time chart showing the major eons, eras, periods and epochs, with ages (after the UNESCO International Stratigraphic Chart). Added information includes the timespan of birds.

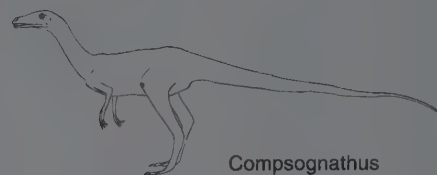
| Eon         | Era         | Period        | Epoch         | Age (Mya)       |       |               |
|-------------|-------------|---------------|---------------|-----------------|-------|---------------|
| Phanerozoic | Cenozoic    | Quaternary    | Holocene      | 000.01–000.00   | Birds |               |
|             |             |               | Pleistocene   | 001.64–000.01   |       |               |
|             |             | Neogene       | Pliocene      | 005.20–001.64   |       |               |
|             |             |               | Miocene       | 023.50–005.20   |       |               |
|             |             |               | Oligocene     | 035.50–023.50   |       |               |
|             |             | Paleogene     | Eocene        | 056.50–035.50   |       |               |
|             |             |               | Paleocene     | 065.00–056.50   |       |               |
|             |             | Mesozoic      | Cretaceous    | Late            |       | 097.00–065.00 |
|             |             |               |               | Early           |       | 146.00–097.00 |
|             |             |               | Jurassic      | Late            |       | 157.00–146.00 |
|             | Middle      |               |               | 178.00–157.00   |       |               |
|             | Early       |               |               | 208.00–178.00   |       |               |
|             | Triassic    | 245.00–208.00 |               |                 |       |               |
|             | Paleozoic   | Permian       | 295.00–245.00 |                 |       |               |
|             |             | Carboniferous | 355.00–295.00 |                 |       |               |
| Devonian    |             | 410.00–355.00 |               |                 |       |               |
| Silurian    |             | 435.00–410.00 |               |                 |       |               |
| Ordovician  |             | 500.00–435.00 |               |                 |       |               |
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## Avian Origins

In 1861, a chicken-sized fossil from Bavaria turned the scientific world on its head. Named *Archaeopteryx lithographica*, this animal had the feathers and wings of a bird, but the body, tail and jaws of a reptile—even its wings had hands and claws, and so it was hailed as ‘proof’ that birds evolved from reptiles. It was not until much later that the true significance of *Archaeopteryx* was revealed, when comparisons were made with those of the coelurosaurian dinosaur *Compsognathus*. Indeed, so similar are these fossils that without its feather impressions, *Archaeopteryx* could have been regarded as just another compsognathid dinosaur, if a rather odd one. The discovery of *Archaeopteryx* spurred a debate over the origins of the class Aves that lasted until the late 1990s, when several small dinosaurs, from the primitive *Sinosauropteryx* to the dromaeosaurid *Microraptor*, were found in sites across northern China. Each dinosaur was covered by integuments that were obviously feathers (Chen *et al.* 1998, Xu, Zhou & Wang 2000, Xu, Zhou, Wang, Kuang *et al.* 2003). Thus, possession of feathers is not indicative of being a bird, but is a primitive (‘plesiomorphic’) state within the coelurosaurian theropods; even primitive relatives of *Tyrannosaurus* had proto-feathers (Xu *et al.* 2004). Rather, it is the possession of flight, contour and down feathers, and the combination of a variety of other skeletal modifications that separate birds from their closest relatives within the Dinosauria. *Archaeopteryx* and its kin still act as a morphological bridge, bearing a mosaic of primitive reptilian features such as teeth and the long bony tail without a pygostyle alongside more modern bird-like features, including asymmetrical flight feathers on the wings. The more we find out about dinosaurs such as *Microraptor* and its relatives, the more we realise that the distinction between birds and dinosaurs is an arbitrary line based on no single, unique feature. We know that the pygostyle is not a uniquely avian feature either and is found in a number of oviraptorosaurs as well (e.g. Barsbold *et al.* 2000). We know that the wishbone, or ‘furcula’, is found in many theropods, including *Tyrannosaurus*, one of the most advanced members of that group. There is also evidence that pneumaticisation of the bone—the evolution of hollow bones supported by internal struts—is a theropod characteristic, not a purely avian one. However, no non-avian theropod found so far has all these traits in one skeleton, while the fusion of the trunk vertebrae and the supporting struts of the ribs are uniquely avian. The closest relatives of the birds, the Dromaeosauridae, possess a suite of other features that can shed light on how birds themselves came into being. If we take a closer look at the arboreal *Microraptor gui*, for example, we find that not only does this tiny dinosaur have flight feathers, but it has them on all four legs. These feathers are asymmetrical in form, like those of modern birds. Yet, this is a bona fide dinosaur, not a bird. *Microraptor* has given credence to the ‘tree-down’ hypothesis of bird origins, which had floundered through the lack of examples of arboreal dinosaurs. Until *Microraptor* was discovered, the alternative theory, the ‘ground-up’ concept, was gaining favour, despite there being so many problems as to how this could be the accurate scenario, given that all modern species of flying and gliding organisms are plesiomorphically arboreal. It has since been suggested that the initiation to flying came through these tiny animals jumping about in the branches of the trees of their forest home, with the hindwings forming feathered ‘edges’, which aided lift. The four-winged approach to gliding in this dromaeosaurid came as a complete surprise and led to the re-examination of *Archaeopteryx* and later forms (Christiansen & Bonde 2004, Zhang & Zhou 2004), which revealed that their leg feathers still bore some similarities with those of *M. gui* rather than with the more typical contour feathers that we see today on the legs of birds. Although there are still several opponents to the ‘birds-as-dinosaurs’ theory, general opinion is that the evidence for birds being descendants of theropod dinosaurs is overwhelming.

Despite all of the recent discoveries in China, the Archaeopterygidae are still regarded as the oldest known group of birds, although they are not regarded as directly ancestral. There are still a large suite of reptilian features in the skeleton, including a reptilian physiology, a ‘reversed’ pelvis more similar to their Saurischian ancestors, an unfused rib cage, and a long, bony tail. Also unlike modern birds, the most notable feature is the lack of a horny beak. The recent description of a tenth specimen has revealed more about *Archaeopteryx* and may throw our interpretation of the evolution of birds through a new twist: this example reveals features not shown in the others, clarifying the position of the four toes in relation to each other and, more amazingly, the presence of a ‘switch-claw’, otherwise found only in the dromaeosaurs and the fossil bird *Rahonavis*. Cladistic study also indicates that this discussion on fossil birds should include the dromaeosaurs and the related troodontids as both would be classed as members of the Aves if this is defined as the clade including the ancestor of *Archaeopteryx* and the birds (Mayr, Pohl & Peters 2005, Mayr, Pohl, Hartman & Peters 2007), rather than lying outside the group phylogenetically (as per Sereno 1999),

Archaeopteryx, Confuciusornis and relatives  
(the ‘dawn birds’)  
10–15 species, 9–10 genera



Compsognathus



Sinosauropteryx



The primitive Tyrannosaurid  
Dilong



Tyrannosaurus



The primitive Oviraptorosaur  
Caudipteryx

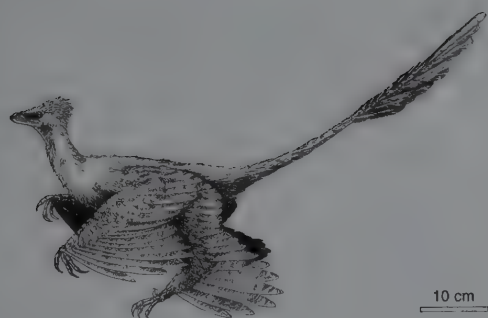


Velociraptor,  
a typical Dromaeosaur

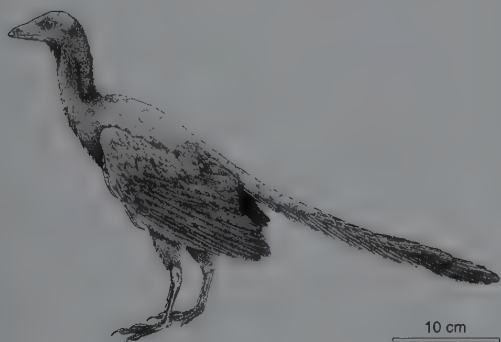


Troodon

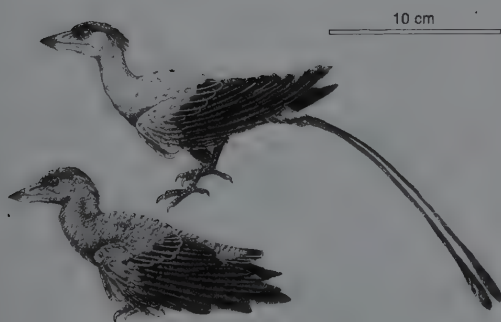




Several tree-dwelling dinosaurs have been discovered recently in Cretaceous rocks in northern China (Xu, Zhou & Wang 2000, Xu, Zhou, Wang, Kuang et al. 2003; Zhang et al. 2002). Among the best preserved are those fossils of *Microraptor*, in particular *M. gui*. This tiny arboreal dromaeosaurid had a long tail with pennaceous feathers towards its distal end. Such vaned feathers were also present on the forelimbs and hindlimbs, giving the animal a four-winged mode of gliding, or even limited powered flight, between the branches in its forest home.



The members of *Archaeopteryx*, including *A. lithographica*, were birds found in tropical coastal scrubland surrounding extensive networks of coastal freshwater and brackish lagoons. The claws on its feet indicate that it spent much of its time on the ground below the shrubs and trees and that *Archaeopteryx* was, at best, a facultative percher.



*Confuciusornis sanctus*, collected from Liaoning Province in northern China, is remarkable for a number of features, from its comparatively short bony tail to its horny beak. This species may have shown sexual dimorphism, with males (above) perhaps being larger and having long tail streamers.

although there is still debate as to whether this is an accurate interpretation (Corfe & Butler 2006, Mayr & Peters 2006). *Archaeopteryx* itself had poorly-developed flight muscles and could not fly as well as modern birds. Its long tail shifted its centre of balance behind the wings, again unlike modern species. Its claws tell us two different tales. Those on the wings were adapted primarily for climbing, while those on the hindlimbs suggest a ground-based animal. Current consensus is that *Archaeopteryx* was primarily terrestrial, but may also have been a facultative percher, if it perched at all (Mayr et al. 2005). *Archaeopteryx* inhabited a coastal scrubland of low-growing conifers, cycads and similar species, intermingled with more tree-like species such as firs and ginkgos. This vegetation was concentrated around shallow coastal lagoons that abounded in Europe in the Late Jurassic. It may be that, at the coastal edge, as around Solnhofen, the habitat was more open than that known to exist further 'inland' during the period. *Archaeopteryx* may have utilised its limited flight capabilities in the open spaces, adopting a ground-hugging flight pattern (O'Farrell et al. 2002). *Archaeopteryx* was also unable to perform a sudden halt, instead needing a short runway to come to a stop. All this suggests that *Archaeopteryx* flew between areas of vegetation, landed on the ground, then clambered into the bushes to reach food, or to escape predators.

For more than 100 years, *Archaeopteryx* was the only basal bird known to science. Then, in 1995, news came out of Liaoning Province, China, of Early Cretaceous birds that bore many similarities to *Archaeopteryx*, but had just as many differences. These were named *Confuciusornis sanctus*. About the size of the Eichstätt specimen of *Archaeopteryx*, these new birds were toothless, with evidence of jaws covered by a horny beak, while they possessed a short tail. Feather impressions were preserved around many of these fossils, revealing two types of tail feather: many had short tail feathers, but some had long strap-like tail streamers. These may represent immatures and adults or, the more popular interpretation, they represent females and males, respectively: *C. sanctus* may therefore be the oldest species of bird known to show sexual dimorphism. Like *Archaeopteryx*, *Confuciusornis* had forelimb claws, but in this species they were relatively more robust, although its climbing abilities have been questioned (Chiappe et al. 1999, Peters & Ji 1999). There are further modifications to the hand, in that digits I and III are strengthened, while digit II is more slender, probably being used in life to facilitate the bird's gliding ability, suggesting that the species was better adapted to flight than *Archaeopteryx*, although neither had the capabilities of modern birds. Hundreds of specimens of *Confuciusornis* have now been found at the sites. It is known that the area of Liaoning was an extremely turbulent place in terms of volcanic activity during the Early Cretaceous, and it may be that a mass-mortality event has been preserved in the fossil record. Alternatively, this collection of fossils may represent a colony, indicating that *Confuciusornis sanctus* was, in fact, gregarious. A second, smaller, species, *C. dui*, has also been described, and is the earliest fossil bird recovered with its keratinous bill intact. Two others were also described within the genus, but reanalysis of the family has concluded that these were misinterpretations of fossils of *C. sanctus* (Chiappe et al. 1999). *Confuciusornithidae* does contain one other species that has stood up to analysis. In fact, it has been classified as separate generically: this is *Changchengornis hengdaoziensis*, from the Chinese Late Cretaceous (Ji et al. 1999). This family was recovered from deposits within what is known as the Yixian formation (Chiappe et al. 1999, Zhou et al. 2003). These deposits, together with those of the Jiufotang deposits, constitute the 'Jehol Biota' and cover much of eastern Asia. The palaeoecological picture of the region is one of a diverse biota, with a large variety of vertebrates and early forms of flowering plant. These are preserved in ways that suggest that they lived in a predominantly marshland or wet-forest environment and that, in some areas, for instance around Liaoning, catastrophic mass-mortality events occurred that allowed the preservation of whole communities. These Cretaceous deposits provide evidence for the co-existence of different higher groups of birds, exhibiting a mosaic of avian features that constitute different degrees of evolution. Contemporaneous with *Confuciusornis*, for instance, were: the basal enantiornithine *Protopteryx*; its more advanced relatives, such as *Jibeinia*; basal carinate (modern-type) species, such as *Liaoningornis*; and the more advanced wader-like *Hongshanornis*. Meanwhile, the more derived *Changchengornis* of the Late Cretaceous lived alongside primitive basal birds like *Jeholornis*.

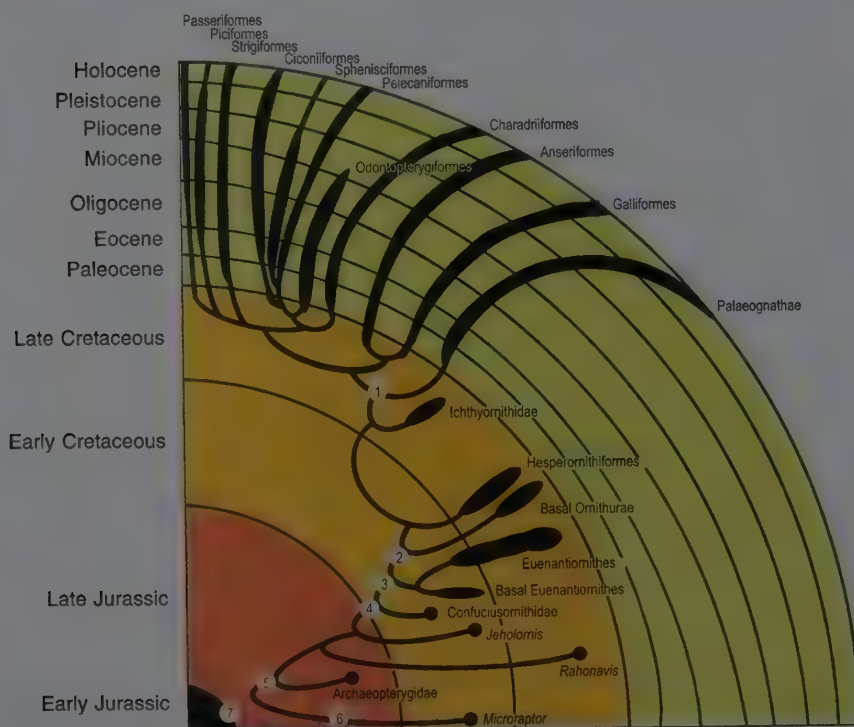
Perhaps special mention should be made of two of the basal birds, namely *Jeholornis prima*, and another, rather enigmatic, basal 'bird' from Madagascar, *Rahonavis ostromi*. While the exact position of *Jeholornis* within the class Aves has been questioned, the identity of *Rahonavis* even as a bird has come under scrutiny. Today, there are two camps, one which regards it as a bird (Chiappe 2002, Chiappe & Dyke 2006, Forster et al. 1998, Zhou & Zhang 2002b) and one which feels that it is better placed immediately outside this grouping (Holtz 2000, 2001), possibly within *Dromaeosauridae*.

itself (Clark *et al.* 2002, Makovicky *et al.* 2005). Some have suggested that dromaeosaurs may be more closely related to *Confuciusornis* and all other 'Pygostylia' than they are to *Archaeopteryx*, putting them within the radiation of what we call 'birds' (Mayr *et al.* 2005). Both birds had wing-claws and long reptilian tails, but there the similarity ends. The Chinese *Jeholornis* had a primitive lower torso, but possessed an advanced scapula similar to modern birds, suggesting a better capability of flight than *Archaeopteryx*. It was probably an arboreal species. The stomach contents are well preserved in this fossil, and indicate that *Jeholornis* fed on seeds (Zhou & Zhang 2002b). The remains of *Rahonavis* include a remarkable sickle-like claw on the second toe of the foot (Forster *et al.* 1998). At the time of discovery, this claw added a major feature to the debate on bird origins, for the only other animals that had been found with such a claw were the dromaeosaurs. It has now been described for the most recently discovered specimen of *Archaeopteryx*, providing more evidence for a relationship between the two groups (Mayr *et al.* 2005). The only other elements of *Rahonavis* to have survived are the basal vertebrae of a long tail and the upper arm bones of the right wing. Therefore any reconstruction of this species is purely supposition, although it might not be too far-fetched to suspect that the species was predatory.

### The 'Opposite Birds'

In 1981, Walker described a new major radiation of Cretaceous birds, which he called the Enantiornithes. He also nicknamed these the 'opposite birds', as one insignificant-looking, but immensely important, skeletal characteristic separates the enantiornithines from all other birds: the nature of the fusion of the tarsometatarsus. In modern birds, the fusion occurs towards the foot (distal) end, rather than the body end, i.e. it shows a 'disto-proximal' fusion. In the 'opposite birds', the fusion occurs at the body end, i.e. the opposite way round. Like the Urvögel and confuciusornithids, the Enantiornithes possessed wing-claws and a reptile-like growth-rate and physiology, both of which caused earlier researchers to group these three lineages into the Sauriurae. However, this interpretation was in error: the Enantiornithes are, in reality, the sister-group to a lineage containing all modern birds as well as such famous toothed species as *Ichthyornis* and *Hesperornis* (Chiappe & Dyke 2002). The phylogenetically important Enantiornithes are also important ecologically, for they were the dominant avian group in the Cretaceous. In their heyday towards the end of that period, the Enantiornithes occupied as diverse a set of niches as modern birds, while they were also distributed across every continent. The most primitive member of the group, the starling-sized *Protopteryx fengningensis*, was discovered in the same Early Creta-

Enantiornithes (opposite birds)  
44–46 species, 39–40 genera



Diagrammatic representation of the major groupings of birds, alongside the fossil record of some select neornithine groups. Thick lines and spots represent fossil occurrences.

Diagram based on a combination of Chiappe & Dyke 2006 (non-neornithines) and Cracraft 2001 (neornithines).

- 1 = Neornithes
- 2 = Ornithurae
- 3 = Ornithuromorpha
- 4 = Pygostylia
- 5 = Aves
- 6 = Dromaeosauridae
- 7 = part of Paraves (i.e. excluding Therizinidae & Oviraptorosauria)





The Enantiornithes, or 'opposite birds', were a major constituent of the bird fauna in the Cretaceous, and were the most speciose group of Early Cretaceous birds in China (Chiappe & Dyke 2006). However, they had completely disappeared by the beginning of the Tertiary. Early enantiornithines were small, toothed arboreal birds. One of the Chinese species, *Protopteryx fengningensis* exemplifies these early species, but in addition has some unusual features, such as the two tail-strap 'ribbons'.

ceous formations as the confuciusornithids (Zhang & Zhou 2000). Other primitive enantiornithines are known from Spain, including the thrush-sized *Iberomesornis romeralli* (Sanz *et al.* 1988) and the goldfinch-sized *Eoalulavis hoyasi*, and Australia, in the form of *Nanantius eos* (Molnar 1986). The enantiornithines possessed a mosaic of primitive and modern characteristics, a common feature among basal birds. Even *Protopteryx* exhibited a mosaic of features, including wing claws, and a keel and procoracoid to which powerful flight muscles were attached, and asymmetrical flight feathers (Zhang & Zhou 2000). However, *Protopteryx* is marked out among the Enantiornithes by the possession of some very unusual, barbless, strap-like tail feathers, the nature of which has been found in only a few other species, most notably as the elongated central tail feathers in *Confuciusornis*, whilst something superficially similar is found in a few members of the modern Paradisaeidae. Like *Confuciusornis*, the tail ribbons of *Protopteryx* may have had the primary role as a counterbalance to the body, as both birds possess remarkably short tails otherwise. It is possible that they may also have been used for display. What *Protopteryx* does share with other early enantiornithines is its small size, few small teeth, fairly well-developed wing-claws and a perching habit. Later species were much larger: for example, *Enantiornis leali* from the Late Cretaceous of Argentina had a wingspan of about 1m (Walker 1981). They were also toothless and had reduced wing-claws—in *Halimornis thompsoni*, a seabird of the Cretaceous American Interior Seaway, these claws were so reduced as to be vestigial (Chiappe *et al.* 2002). A few enantiornithines have provided us with direct evidence of their diet. *Eoalulavis*, for instance, as well as being celebrated as the earliest bird with an alula, is also the earliest bird so far discovered to still contain the remains of its last meal in its stomach, in this case small, aquatic, crustaceans (Sanz *et al.* 1996). For the majority, however, we have to look at their skeletal morphology and compare it with modern examples to work out what they may have fed on and how they lived generally. For instance, the possession of small teeth in some of the more primitive species may signify an insectivorous diet, as may have been the case with, for example, *Protopteryx*. Other species, such as *Sinornis santensis* and *Boluochia zhengi*, both from Cretaceous China, had adopted a raptorial lifestyle, and may have occupied the niche held today by shrikes and small falcons (Hou 1996, Zhou 1995).

### Other Toothed Birds

Early Ornithurae  
38 species, 34 genera

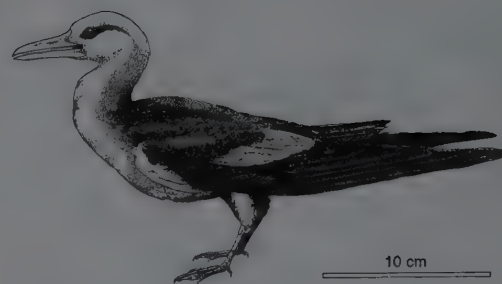


Among the early Ornithurae were a group of flightless, possibly fish-eating, seabirds known as the Hesperornithes. Although diver-like in morphology, they were not related. They are thought to have possessed lobed feet, which were capable of rotating sideways, as with the modern grebes (Feduccia 1996). *Hesperornis regalis* was one of the largest in the group, and lived in the Cretaceous Middle American Seaway.

Another group of birds arose in the Cretaceous that differed from their contemporaries through the lack of growth rings in their bones: in other words, their physiology was not of the reptilian type characteristic of the Enantiornithes, confuciusornithids and Urvögel, but was more avian in form (e.g. Chinsamy *et al.* 1998). These primitive 'Ornithurae' belonged to a new radiation that included the ancestors of the Neornithes, or modern birds. They contained some of the most famous of bird fossils other than *Archaeopteryx*, namely *Ichthyornis* and *Hesperornis*. There are a plethora of forms in addition to these marine species, among which are included *Apsaravis ukhaana*, from semi-arid dune systems of Mongolia, *Patagopteryx deferrariisi*, a flightless bird from Argentina (Chiappe 1996, Chiappe & Dyke 2006), and *Gargantuavis philoinos* of Europe, comparable in size to an ostrich (Buffetaut & Le Loeuff 1998). These toothed birds died out by the end of the Cretaceous. The most recent of the group, listed purely by its museum number, was a Belgian specimen dating from 800,000 years before the Cretaceous-Tertiary (or 'K-T') boundary. It was similar in form to *Ichthyornis*, if somewhat larger, but it was too fragmentary for proper placement (Dyke *et al.* 2002). *Ichthyornis* is perhaps the archetypal toothed flying bird. In a monograph on fossil birds in 1880, Marsh listed seven species in the genus, but these were based on a set of rather arbitrary decisions, one of which involved size differences between the specimens. The first major revision of the genus was performed by Julia Clarke in 2004, when she reduced these seven American species to one, namely *I. dispar*. At the same time, she showed that some of the bones attributed to the genus came from birds more closely related to modern birds than they were to *Ichthyornis*. Indeed, one specimen may be a close relative of the Galliformes, and therefore within the neornithine radiation, the more remarkable given its Late Cretaceous age. The interpretations of the general morphology of *Ichthyornis* remain similar to those described by Marsh, although it is now recognised that the American species was quite variable in size. In summary, *Ichthyornis* was a small Cretaceous toothed seabird with tern-like proportions, including powerful, elongate wings, an elongate bill and small legs and feet. Whether it was a pelagic species of the Cretaceous North American seaways, or whether the bodies merely floated to these deep sea positions from more coastal origins, remains a matter of conjecture. *Ichthyornis* has been described from the Old World and



as far south as Antarctica (see Feduccia 1996), but as yet these specimens have not been compared directly with the American skeletons, so no conclusions can be made as to their relationships or even specific identities. The other major grouping, the Hesperornithes, were also marine birds, like *Ichthyornis*, but there the similarity ends. These were foot-propelled divers, and those so far discovered were all flightless, with vestigial wings and the lack of a sternal keel. The hesperornithids and their kin ranged in size 'from that of a large grebe to the largest of the living penguins' (Feduccia 1996): the American *Hesperornis regalis* has been estimated at 1.5m in length, while *H. rossicus*, from Kazakhstan and Sweden, was even larger. These birds have been likened ecologically to divers, with a diver-like morphology, similar postures, poor mobility on land and a fish-based diet. However, they also differ in a number of ways. For instance, they had a toe rotation convergent on that of the grebes and, like them, probably had lobed feet, rather than webbing. Unlike either group, the hesperornithines were more marine, possibly nesting in colonies on islets and isolated coastlines. Their flightlessness also sets them apart from the divers and most grebes: their bones were more dense than these neornithines, making them better adapted to diving. It may have meant that the birds 'sat' in the water lower than most modern birds, with comparisons being drawn with the subsurface swimming technique of anhingas. The hesperornithines included several species from a number of families, the most familiar of which is the American *H. regalis*, but with more slender relatives such as the Baptornithidae and the primitive *Enaliornis*. Although they disappeared at the end of the Cretaceous, their place was rapidly taken by diving birds from the neornithine groups in the early Tertiary, if not at the end of the Cretaceous.



*Ichthyornis dispar* represents an alternative Cretaceous seabird morphology to that of the flightless hesperornithine form. Recent reconstructions reveal an elegant, long-winged toothed bird that probably dipped after surface prey as it flew close to the surface of the sea (Clarke 2004).

### Neornithes: Modern Birds

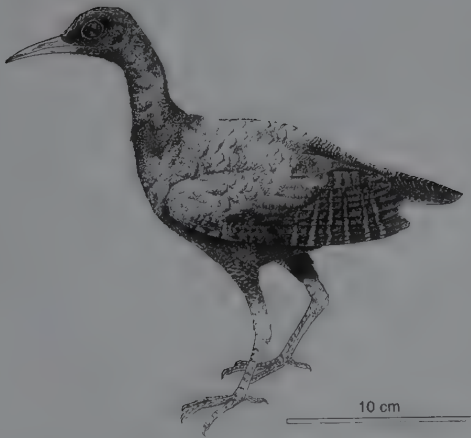
Of the modern bird orders, the ratites and tinamous, also called 'palaeognaths', are regarded as the most basal divergence (Dyke & van Tuinen 2004). However, evidence suggests that their age as a group is comparable to that of many groups of so-called 'neognathous' birds, which makes unravelling their history complicated. The most ancient palaeognaths come from at least the early Paleogene of North America and Europe, in the form of the Lithornithidae (Houde 1988). The fossil evidence to date suggests that palaeognaths originated in the Northern Hemisphere and is thus in contrast to evidence from the modern distribution of the ratites and tinamous, and also *contra* molecular studies (e.g. Cooper *et al.* 2001). When the genomes of two species of moa are included, the origins of the ratites are pushed back into the Cretaceous. The fossil Lithornithidae are an enigmatic group whose relationship to the other palaeognaths is poorly known, although they may have been related to the ancestor of the modern ratites (Dyke & van Tuinen 2004). The Lithornithidae *sensu* Houde (1988) is divided into two grades (see also Davies 2002). One, the *Lithornis-Pseudocrypturus* grade, consists of *Pseudocrypturus cercanaxius* from the Middle Eocene of Wyoming and six species of *Lithornis* from the Eocene of Europe (exemplified by *L. vulturinus*) and the Paleocene and Eocene of North America (e.g. *L. promiscuus*). Specimens have also been found in rocks of putative Late Cretaceous age from New Jersey, USA (Parris & Hope 2002), pushing the origin of this family back into the Cretaceous. These birds were superficially tinamou-like, but they differed in many ways, having a moderately long, sensitive bill and relatively long legs with four toes, the hallux (or 'hind toe') being well developed and adapted for perching. They also possessed an unreduced keel, indicating that they were capable of sustained flight, unlike any modern palaeognath. The second grade consists only of *Paracathartes howardae*, a much larger bird, more heavily set, and evidently a poor flier, adapted for a more cursorial way of living, and possessing a reduced hallux. Recent work on the lithornithids has confirmed their status as palaeognaths through observations on their eggshells (Grellet-Tinner & Dyke 2005), whilst new discoveries indicate that lithornithids are closely related to tinamous, rather than their similarity being purely a consequence of similar lifestyle (Leonard *et al.* 2005). The Lithornithidae died out by the Middle Eocene, when the only palaeognath present was the European *Palaeotis weigelti* (family Palaeotidae), a more advanced species related to extant forms such as the ostriches (Houde & Haubold 1987), if not to all modern ratites (Dyke & van Tuinen 2004). Like the modern species, *Palaeotis* was flightless, had long legs and lacked a hallux, consistent with a cursorial way-of-life. It also possessed a narrow bill, similar to that of a cassowary. *Palaeotis* was similar in size to a small modern crane (Olson 1985). Originally described as a bustard, *Palaeotis* was later redescribed as an ostrich, when it raised the possibility that the ratites were, in fact, offshoots of some neognathine lineage, with their resultant primitive states being the result of extreme neotony (retention of juvenile features into adulthood). Even the palaeognathous palate has been

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Unassigned Neornithines  
22–23 species are unassigned even to order.

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Palaeognaths  
62 fossil species, 35–36 genera



Although the Lithornithidae had an appearance reminiscent of the Neotropical tinamous, they differed in a number of ways, most notably in the their perching foot and the ability to perform sustained flight. *Pseudocrypturus cercanaxius* was found in Middle Eocene deposits of Wyoming, USA. A putative *Pseudocrypturus* has also been suggested from Europe (Houde 1988).

suggested to be a result of neotony. However, the discovery of the lithornithids and a reanalysis through morphological and molecular studies have revealed no relationship with modern neognathous birds.

Combined fossil and Molecular studies suggest that the oldest 'modern' group of ratites are the rheas of South America (Cooper *et al.* 2001), with the moas of New Zealand being the next offshoot. However, other studies differ: in those that incorporate molecular and fossil work, the old associations reappear, although in a different ordering, with the ostrich/rhea partnership being the most recent split, the kiwi/moa partnership the oldest, and the cassowary/emu partnership splitting off somewhere in-between. In this scenario, *Palaeotis* evolved from the ancestor of all modern ratites (as per Dyke & van Tuinen 2004), and is not directly related to the ostriches, while the lithornithids would be ancestral to all of the above, with the tinamous being the most ancient group. This last is at odds with the fossil evidence for tinamous alone, as the oldest species found are Miocene in age (Bertelli & Chiappe 2005). The one drawback with the second molecular study is that the associated details that would allow us to see if this was a better phylogeny have not been published as yet, while arguments as to why the study differs from that of Cooper *et al.* (2001) have not been put forward. These are only two examples of the arguments currently raging over the origin of ratites, but what these studies have done is instigate debates about the need to link known fossils into molecular calibrations. Obviously, they have also highlighted the problems of ratite biogeography. If the ratites are of northern origin, as the discovery of *Palaeotis* suggests, why are all modern ratites found on the remnants of Gondwana, with no relatives in Europe today? Conversely, if the ratites are of southern origin, as the molecular information suggests and which seems to be the more plausible explanation, where are the Gondwanan fossils? There is still a huge gap in the fossil record with respect to early Tertiary ratites. At least one of the mysteries in ratite evolution has been resolved recently, namely the origins of the two-toed ostriches of the genus *Struthio*. For a long while, the only early *Struthio* fossils known came from the Miocene of Moldavia, in the form of *S. orlovi* (see Feduccia 1996), while there was an extensive record of ostriches from the Pliocene and Pleistocene of Europe and Asia, including the widespread *Struthio asiaticus*, the European *S. brachydactylus* (which may also have existed in the Late Miocene), and the giant Georgian *S. dmanisensis* from the Early Pleistocene. At the same time, only thickset, graviportal ostriches (originally thought to belong to the Aepyornithidae), such as *Diamantornis*, were found in African deposits. It was theorised that *Struthio* had evolved in the grasslands of Asia and Europe, and that it was only later that it spread into Africa, when the graviportal species disappeared. Then, in the 1990s, a Lower Miocene ostrich, *S. coppensi*, was described from Namibia (Mourer-Chauviré *et al.* 1996), while a biostratigraphic series from the early Neogene was described from the same area, showing changes in egg type from 'aepyornithoid' (i.e. *Diamantornis*) to 'struthioid' (i.e. *Struthio*). Thus, one graviportal ostrich at least was the direct ancestor of a modern *Struthio* (Senut *et al.* 1998). These discoveries have turned the older theories on their head, for now it is possible to state that the gracile, two-toed ostriches did originate in Africa, migrating out into Eurasia in the Late Miocene to take advantage of the spreading grasslands that subsequently dominated through the Pliocene and Early Pleistocene. The early fossil record of the other living ratites is not as full. Only the rheas have a fairly substantial record, mainly of Pliocene forms such as *Hinasuri nehuensis* and Pleistocene representatives such as *Heterorhea dabbeni* (Tambussi 1995). Possibly related to these are the Opisthodactylidae from the Upper Paleocene to Miocene, members of which include *Diogenornis fragilis* from southern Brazil and *Opisthodactylus patagonicus* from Argentina, but the fossils of many of these are rather fragmentary. All rheas are South American, so it is reasonable to assume that they originated there, rather than evolving elsewhere then migrating into South America. Likewise, the cassowaries and emus originated from within the range they occupy now, in Australia. However, they have a very limited fossil record, with a pygmy cassowary, *Casuarius lydekkeri*, from the Pleistocene of New Guinea and a number of emus from Australia (Vickers-Rich *et al.* 1988). The emus are of particular interest, as there exist two species that share characters of both the forest (cassowary) form and the bush (emu) form, namely *Emuarius gidju* and *E. guljaruba*, from the Oligocene. These are probably close to the basal stem lineage before the cassowaries and emus split and adapted to different habitat types (Boles 1992, 2005a; see also Feduccia 1996).

Three modern ratite families are now extinct, namely the Aepyornithidae and the two families within the order Dinornithiformes. The elephantbirds (Aepyornithidae) were formerly thought to share a close relationship with the ostriches (see Feduccia 1996), but molecular techniques have pointed at a more derived ancestry with the kiwis, cassowaries and emus, and that the graviportal ostriches of Africa were probably not of this family, the Aepyornithidae being endemic to Madagascar (see Davies



2002). The family consisted of seven species in two genera: three species in *Mullerornis*, which died out during the Pleistocene, and the four larger species in *Aepyornis*, ranging from the Pliocene to early Holocene. These were heavy-bodied birds, but only one reached elephantine proportions, namely *A. maximus*, the Vouronsatrana (Marden 1967), standing at 2.7–3 m and estimated at 418–457 kg (Amadon 1947), making it the heaviest bird known: the largest extant ratite by comparison, the Ostrich (*Struthio camelus*) weighs a mere 100–135 kg. Like all the larger ratites, the aepyornithids were herbivorous browsers (Wetmore 1967); the giant size of the largest may have allowed it to graze the higher branches of bushes and small trees, out of reach of its smaller relatives. The last of the aepyornithids, *A. maximus* itself, disappeared at a time coincident with human arrival on the island, eventually becoming extinct by the end of the 16th century. It seems that human overexploitation of the environment caused its downfall, rather than direct persecution (Burney 1993, Burney *et al.* 2003).

The speciose moas of New Zealand also succumbed to human colonisation, but in their case it was a combination of Maori hunting pressure and loss of habitat that wiped out most of the species by the 14th century (Holdaway 1989, Huynen *et al.* 2003, Worthy & Holdaway 2002). One species, *Megalapteryx didinus*, may have survived just long enough to be seen by the first European settlers. However, doubt has been cast on the reliability of these sightings, while archaeological evidence associated with Holocene moa bones indicate that moas were wiped out long before the European colonisation (Anderson 1989). The plethora of moa bones and the presence of mummies has meant that the Dinornithiformes have been extensively studied and written about, both in terms of their evolutionary history and ecology (see Worthy & Holdaway 2002). Although the oldest known moa fossils date to only 2.5 million years ago (mya), at the end of the Late Pliocene (Worthy *et al.* 1991), their DNA indicates that these flightless giants diverged from the other 'modern' lineages more than 80 mya, in the Late Cretaceous (Cooper *et al.* 2001). These studies also suggest that ratites invaded New Zealand on two different occasions, rather than the moas and Kiwis sharing a common ancestor. The 10–11 species of moas are divided into two families: Emeidae (synonym: Anomalopterygidae), consisting of the majority of species, generally robust in form; and Dinornithidae, containing only the two species of tall moas, exemplified by the North Island *Dinornis novaezealandiae*, (which includes *D. giganteus*). The two families split from each other about 18 mya, when much of New Zealand became submerged, while the major diversification of species occurred about 4–10 mya, when New Zealand was experiencing major geological upheavals in combination with climatic cooling (Baker *et al.* 2005). Both moa groups are characterised by a great variation in size within the species, which has been attributed to reversed sexual dimorphism, for example in *Pachyornis*, *Emeus* and *Megalapteryx* (Worthy 1987, 1988), culminating in a recent combination of morphological and molecular analyses which have shown that, in *Dinornis* at least, the females were as much as twice the size of the males (Bunce *et al.* 2003). This has led to immense confusion over the number of species in the past, with up to 38 being recognised, a problem confounded by the lack of understanding that moas had a slow growth rate when compared to other birds (Turvey *et al.* 2005). Despite their ancient demise, moa signs can still be seen in New Zealand today, from (probable) ancient trackways (Horn 1989) to the better substantiated effects of these herbivorous birds on the evolution and ecology of many of New Zealand's native plants (see, e.g., Bond *et al.* 2004, Greenwood & Atkinson 1977). The picture emerging is one of differing habitat and feeding preferences, with some species, such as *Dinornis robustus* and *Pachyornis mappini*, being widespread in a variety of habitats, the former primarily feeding on coarse twigs and fibrous shoots, the latter on tough leaves, while others, such as *Anomalopteryx didiformis* (another specialist of tough leaves) and *D. novaezealandiae*, were species dominating in the more heavily forested regions. Some, for instance *Megalapteryx didinus*, foraged along upland forest edges as well as in high-altitude grasslands (Worthy 2002). Finally, *Euryapteryx* and *Emeus* contained shrubland species that fed primarily on soft leaves and berries.

Whilst the evolution of the ratites is tied up with the land, that of the next few groups is linked with water, in particular the sea. The 'seabird' morphology has occurred several times in the fossil record. We have already seen this in the toothed birds, where there are long-distance fliers, such as the enantiorn *Halimornis*, and diver (= gaviiform) types, such as *Hesperornis*, *Baptornis* and relatives. Even the gull morph has occurred several times, first in such toothed birds as *Ichthyornis* and later with the true gulls and within the Pelecaniformes. In addition, several seabird species, ancient and modern, have evolved heightened swimming skills at the cost of flight, itself an energy-costly form of locomotion. The most famous of this last group are probably the penguins. Today there are about 20 living species, but over 50 additional species are found in the fossil record, with many coming from South America and Antarctica,



Females of the *Dinornis* moas were almost twice the size of the males: sexual dimorphism in the other moa species was not so extreme. Compared to other ratites, the dinornithid moas were huge, only exceeded by members of the Aepyornithidae. Current opinion is that there were only two species of Holocene dinornithid, *D. novaezealandiae* (shown here), on the North Island, and *D. robustus*, the South Island equivalent.

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*Sphenisciformes* (penguins)  
52–55 fossil species, 33–35 genera





The Plotopterids, like this Japanese species, *Copepteryx titan*, were large cormorant-like birds related to boobies and gannets. Flightless, they possessed a feature that today is only seen in the penguins (*Sphenisciformes*): an advanced flipper-like wing. Inhabiting the north Bering Sea, these large birds appear to have been the ecological equivalent of the Southern Ocean penguins. Indeed, one authority (Mayr 2005d) has even pointed at a possible sister-relationship between the two groups.

Gaviiformes (divers)  
16–18 fossil species, 5–7 genera

the majority originating from the early Tertiary. The oldest-named species, *Waimanu manneringi*, comes from the late Early Paleocene of New Zealand (Slack *et al.* 2006). At an estimated height of 80 cm, this species was about the size of a Yellow-eyed Penguin (*Megadyptes antipodes*). However, unlike that species, but like other ancient penguins, *Waimanu* possessed an elongate skull and bill. Other ancient penguins are renowned for their large size. The Late Paleocene *Crossvalia unienwillia*, for instance, was a penguin 1.4 m tall from Seymour Island (Tambussi *et al.* 2005), a place that has revealed 28% of the known fossil penguin species. The largest species, however, must be *Anthropornis nordenskjöldi*, from the Late Eocene of Seymour Island, and *Pachydyptes ponderosus* a Late Eocene New Zealand penguin. George Gaylord Simpson (1946) estimated that these birds had a maximum standing height of 5'4" (1.6 m), although he admitted that there was a large degree of error involved in the sorts of estimates undertaken. These early penguins were similar in general appearance to modern species, and some species were already highly colonial, like their modern counterparts. Penguin relationships to other birds are, however, still ambiguous, with suggested connections with the tubenoses (*Procellariiformes*), through similarities of fledgling nasal morphology combined with other osteological features. More recently, G. Mayr (2005d) has suggested a possible close relationship between the penguins and an extinct group of cormorant-gannet relatives, the Plotopteridae, an amazing northern Pacific family of large to gigantic seabirds that, although cormorant-like in many respects, bore flipper-like wings similar to those of the penguins and which have been considered ecological equivalents since their discovery. The first species to be described was the Early Miocene *Plotopterus joaquinensis* of California, the coracoid of which Hildegard Howard (1969) recognised as coming from an as yet undescribed form that 'flew' through the water. However, she could not state emphatically that the birds were flightless, although she did infer it. She estimated the size of the bird, likening it to Brandt's Cormorant (*Phalacrocorax penicillatus*). Several more fossils have subsequently been described from sites in Japan (Olson & Hasegawa 1979), including the largest species, the Late Oligocene *Copepteryx titan*, estimated at 1.8 m in total length. However, the earliest species, *Phocavis maritima*, was found by Goedert (1988) in Late Eocene deposits in Oregon. The demise of the group in the Early Miocene has been attributed to the rise of the sea mammals, the proliferation of which may also have caused the extinction of the giant penguins in the Southern Hemisphere (Simpson 1971). However, rising sea temperatures may also have contributed to the extinction of these giant diving birds (Goedert 1988).

The divers have also been suggested as the northern sister-group to the penguins through similarities in the bill morphology of some fossil penguins. However, like other groups, there are no intermediate forms that would suggest such a relationship. A substantial number of Gaviiformes have been recorded from the Miocene and Pliocene of Europe and North America. Many of these are currently placed in the genus *Gavia*, but Mayr (2004e) states that some of these birds are 'clearly stem group representatives of the Gaviidae'. The marine *Colymboides* are the earliest definitive divers, with a range extending from the Eocene to the Early Miocene. They include the teal-sized *C. minutus* from the Late Oligocene/Early Miocene of France. Although these birds were recognisably divers, their leg morphology was less adapted to foot-propelled swimming than modern species. Indeed, R. W. Storer, who studied *C. minutus* in 1956, pointed out that the differences observed between *Colymboides* and *Gavia* have a lot to do with the smaller size of *Colymboides* and its lesser degree of specialisation. Even so, a species found in Germany, *C. metzleri*, has revealed that even this primitive marine genus specialised on a diet of fish. Two putative divers, *Neogaeornis* and *Polarornis*, are of particular interest as they come from Upper Cretaceous deposits in Chile and Antarctica respectively (Chatterjee 2002, Olson 1992a); they may even be the same species (Mayr 2004e). The former consists of a single tarsometatarsus, while the remains of *Polarornis* are more extensive. However, even here, the reconstruction of much of the fossil has been questioned, whilst five of the six characters used to assign it to within the Neornithes are also found in more primitive Mesozoic birds. The relationship of *Polarornis* and *Neogaeornis* with the Neornithes, let alone the Gaviidae, is therefore still debatable and awaits further analysis, particularly given their physical location well outside the distribution of all other known divers.

The next group in traditional classifications, the boobies, cormorants and darters, have a strong fossil record, with a total of about 80 species, examples coming from all continents except Antarctica. Of the three groups today, only the darters are primarily freshwater, and while the cormorants have freshwater examples, the boobies are exclusively marine. Although the similarity in habitat type is true for the fossil record for two of these families, the earliest species of sulid, *Masillastega rectirostris*, from the Middle Eocene of Messel, Germany, was at least partially freshwater. If this is indeed a sulid, it would be the only member of the family known from freshwater deposits

Pelecaniformes and Odontopterygiformes  
125–129 fossil species, 46 genera,  
12 named families

(Mayr 2002d). Known from a single skull, *Masillastega* possessed a longer bill in relation to other features than its modern counterparts; this is probably due to the specialization of modern species to the plunge-diving technique so characteristic of the Sulidae. The next oldest is *Sula ronsoni*, from the Early Oligocene of France, some 15 million years later, but this is a marine species, more typical of the family. The identity of other species in the family is not so controversial, yet they still reveal interesting facts. One is that the north Pacific had its own group of gannets (as opposed to boobies), although that lineage ended with the Californian *Morus reyanus* in the Late Pleistocene (see Olson 1985). The majority of fossil sulids come from the USA and Europe, although a few, for instance *Ramphastosula ramirezi*, have been discovered elsewhere (in this case, Peru). The discovery of cormorant fossils has also shown a concentration of specimens, and therefore species, in Europe and North America, although species have also been found in Africa, South-east Asia and Australia. The Phalacrocoracidae are remarkable in their overall similarity to each other, and such authorities as Feduccia have noted the lack of morphological diversity within the family, with the only bizarre species being the modern Galapagos Flightless Cormorant (*Phalacrocorax harrisi*)! The fossil darters are more interesting. The earliest purported species is *Protoplotus beauforti*, from the Eocene of Sumatra: this was a small bird, but already with the slender darter-like bill (Lambrecht, cited in Martin & Mengel 1975). However, it differed from modern anhingas in its limb proportions and small size, which contribute to its position outside of what we would term an 'anhinga' (Vickers-Rich, cited in Olson 1985) and has led to it being assigned its own family, Protoplotidae (van Tets *et al.* 1989). The next oldest, 'true' darters are *Anhinga subvolans* and *Meganhinga chilensis*, from the Early Miocene of Florida and Chile respectively. *A. subvolans* was originally described as a cormorant (Brodkorb 1956), but the condition of the humerus was noted as being similar to that of the darters, a group that tend to soar more than the cormorants (Becker 1986a). *M. chilensis*, on the other hand, was a flightless, giant species, like many of the Miocene anhingas from the Americas, which have also been placed in genera other than *Anhinga* by Noriega and his colleagues in papers from 1992 to 2004 (e.g. Noriega 1992, 2001, Noriega & Alvarenga 2002, Noriega & Piña 2004, Rinderknecht & Noriega 2002). The largest darter found to date is *Macranhinga paranensis*, another Upper Miocene species, this time from Argentina. Weighing an estimated 5.4 kg, it was almost four times the size of the modern American Anhinga (*A. anhinga*). Intriguingly, *M. paranensis* is thought to have hunted using a pursuit-diving technique like that of cormorants, rather than the more typical stalking style of other darters, while it also converged on the cormorants in terms of its flapping flight (Noriega 2001). It should be pointed out that whilst the anhingas listed here are all South American, fossil species are also known from North America, Africa and Australia.

There are a number of other small families within the Pelecaniformes *sensu lato* that deserve some mention. More recent cladistic analyses indicate that their placement within the order is purely through overall similarity of form, rather than any true phylogenetic relationship. This is complicated by the lack of early fossils, so that we are still in the dark as to what the 'proto-sulid' or 'proto-pelican' looked like. What we do find, though, are some tantalizing windows into an alternate world, where freshwater gannets lived, and where brackish-water, gull-like frigatebirds foraged on lakes in North America. One such frigatebird was the North American *Limnofregata azygosternon*, which fed on the fish of deep lakes in what is now Wyoming (Olson 1977). It is proposed that, like gulls today, an assemblage of different species of *Limnofregata* existed, taking advantage of the huge numbers of fish in this giant lake system (Olson & Matsuoka 2005). To date, we only know of two species in this genus, the afore-mentioned, short-billed *L. azygosternon* and the larger, longer-beaked, *L. hasegawai*, both of which are Lower Eocene in age. Their wings were not as long as modern species and, although these birds possessed reduced feet, they were not as small as in modern frigatebirds. Also unlike the marine frigatebirds, the toes were long and well-developed, indicating that *Limnofregata* was able to paddle, probably scavenging fish from the lake surface as many gulls do today. Several factors have been put forward for the extinction of these inland frigatebirds. One is the cooling of the climate that occurred in the early Middle Eocene, another, the infilling and desiccation of the Green River lakes, while the arrival of potential competitors such as the gulls may have been the final element that pushed frigatebirds into the pelagic niche that they occupy now. As old as the frigatebirds are the tropicbirds, constituting the families Prophaethontidae and Phaethontidae. For a long while, the only fossil species known was the Lower Eocene *Prophaethon shrubsolei*, first identified in the late 19th century from southern England, and reappraised by Harrison & Walker in 1976, when it was identified as a new family. Very recently, a new, Paleocene, species has been discovered, therefore older than *Prophaethon*, but equating to the age of other





*Osteodontornis orri* is a member of a group of birds (Odontopterygiformes or Pelagornithidae), the like of which has no counterpart today. At one time, representatives could be found over the seas as far apart as Europe, South America and the Australian Antarctic. These were generally huge birds, with long albatross-like wings, but their main feature was the large bill with its bony 'teeth', probably used to sweep up squid and similar animals from the surface of the world's oceans.

Procellariiformes  
49–51 fossil species, 17–19 genera

tentative prophaethontid fossils found in North America. This new species, *Lithoptila abdounensis*, extends the fossil family biogeographically, as it was found in phosphatic deposits of the Ulen Abdou basin in Morocco; it is also the earliest African neornithine bird fossil discovered to date (Bourdon *et al.* 2005). Other tropicbirds, of the Phaethontidae, are putatively identified from Miocene deposits on both sides of the Atlantic. Although tropicbirds have a similar overall appearance to gannets, this may be purely a result of the plunge-diving technique that these birds specialise in, for the studies of Bourdon and her colleagues point to a relationship between the phaethontid lineages and the Procellariiformes, not the Pelecaniformes—something that has been suggested by a number of other studies. If the recent molecular analyses are correct, then even the pelicans do not belong with this grouping, being the most derived family within a lineage that includes the Shoebill and Hamerkop, usually considered Ciconiiformes (see van Tuinen *et al.* 2001). While there is some evidence for this in the osteology of modern species, the fossil representatives of these other families are too similar to modern forms to shed light on the relationships between the three groups. The fossil record of the pelicans themselves reveals a number of small species from the Tertiary, and several species from the Miocene and Pliocene: the Pelecanidae were widespread early in their fossil history.

Often portrayed as pelican-like, but in reality the most unusual group associated with the Pelecaniformes, is an extinct lineage known as the 'pseudodontorns', a name given to them because of the bony, tooth-like projections along the cutting edges of their immense mandibles (Feduccia 1996). These were giants among the seabirds, yet they were incredibly light, with elongate bones and wings specialised for gliding. For instance, *Osteodontornis orri*, from Late Oligocene and Miocene water off California, had a wingspan of 5.5–6 m (Olson 1985), whilst the smallest species were about the same size as modern albatrosses. This may not be a coincidence, for Olson suggests that, like extant albatrosses, pseudodontorns were probably pelagic species. According to Zusi & Warheit (1992), these gigantic gliding birds fed by taking prey on or from just below the surface whilst they were in flight, using a downward nod of the head, similar to the surface-plucking behaviour of frigatebirds, or sitting on the surface, using a lunging behaviour that can be seen in modern pelicans: the tooth-pegs on the bill may have enabled the birds to hold on to soft-bodied prey such as squid. The pseudodontorns first appear in the fossil record with *Pseudodontornis tenuirostris* from Late Paleocene deposits in the British Isles and *Odontopteryx* species from the Late Paleocene/Early Eocene of Morocco. The first Pacific records come from Middle Eocene deposits in Washington State (Bourdon 2005, Warheit 2002). These birds spread throughout the Atlantic and Pacific oceans very early in their history, and were found as far south as Antarctica. Their reign lasted 57–59 million years, with the last representatives of the group, members of the genus *Pelagornis*, coming from the Pliocene. Like the Pelecaniformes in general, there is a lot of controversy over the phylogeny of the pseudodontorns. They have been assigned to a separate order, the Odontopterygiformes, with an association with the Procellariiformes and Pelecaniformes, or as a separate suborder (Odontopterygia) within the Pelecaniformes itself. Within the latter, most recent authors list the species under one family, the Pelagornithidae, but with the proviso that the exact relationship to other Pelecaniformes is uncertain. Given that the Pelecaniformes are now generally regarded as being polyphyletic, it is perhaps no surprise to find other proposals have been put forward. The most recent cladistic analysis, for example, suggests that the pseudodontorns (as the order Odontopterygiformes) are the sister-taxon to the Anseriformes (Bourdon 2005). However, there are some problems with this study, as other anseriform relatives such as the gastornithids were not included in the analysis, which might have clarified the degree of this relationship.

The earliest fossils of the Procellariiformes come from the Cretaceous and Paleocene, but most are too fragmentary for proper identification, and thus are deemed unassignable (Dyke & van Tuinen, 2005). An isolated humerus from New Jersey Greensand deposits (Lower Paleocene) was listed as *Tyttostonyx glauconiticus*, and is regarded as *incertae sedis* by Kenneth Warheit (2002), although assigned to the family Tyttostonychidae and tentatively placed in the Procellariiformes by Olson & Parris (1987). The earliest definable procellariiform species in Europe are members of the Diomediodidae, reported from the Lower Oligocene of Germany, France & Belgium, as well as from Iran (Mayr *et al.* 2002, Peters & Hamedani 2000). However, it is not known to which of the extant groups they were most closely related. Beautifully preserved specimens of *Diomedoides brodkorbi* (Germany, Early Oligocene) show a peculiar foot morphology most similar to the modern storm-petrel, *Nesofregata*. Although twice the size of the latter, these birds may have shared similar feeding habits, flying into the wind and trailing their feet in the water as they searched for surface prey. All other tubenose fossils belong to extant families, some of which fill anomalies in their distribution. The Diomedidae, for example, are absent today from the

north Atlantic. However, at least five species existed there in the Pliocene, including *Phoebastria/Diomedea anglica*, also found in the Pacific, and *P. rexsularum*, endemic to the north Atlantic (Olson & Rasmussen 2001). A species known as *P. howardae* was also described, but this has since been synonymised with the Short-tailed Albatross (*Phoebastria/Diomedea albatrus*), and accounts for one of three modern species whose ranges extended into the north Atlantic. Bermuda records of this species are particularly interesting as they show a healthy colony existed until the Middle Pleistocene, when a momentary 20 m rise in sea level caused its extinction (Olson & Hearty 2003), thus removing albatrosses from the north Atlantic avifauna. The Procellariidae are the most speciose fossil-wise of the other tubenoses. The coast of Miocene California has been particularly fruitful in searching for procellariiform fossils, and several species of the modern genus *Puffinus* have been uncovered, while the genus *Fulmarus* was also more speciose during this period than it is now. Like fossil members of the Hydrobatidae and Pelecanoididae, these birds are generally indistinguishable from modern genera even if, at the species level, they can be separated.

The long-legged waders are usually the next group in traditional classifications. However, special mention should be made of one group that is usually placed alongside the divers and penguins at the beginning of traditional classifications, namely the grebes, primarily because recent molecular and morphological studies suggest that they are closest to the flamingos and relatives (Mayr 2004f, Manegold 2006, van Tuinen *et al.* 2001), a group traditionally associated loosely with the Ciconiiformes. The grebes have a poor fossil record that sheds little light on any relationship. The earliest described species is *Miobaptus walteri*, from the Early Miocene of Czechoslovakia (Švec 1984), but this is already a typical grebe, as are the several species of *Podiceps* and *Aechmophorus* from the North American Pliocene. If correct, and given the fact that even flamingos swim on occasion, and that their closest fossil relatives, the Palaelodidae, were better adapted to swimming, it is suggested that the ancestor of the Phoenicopteriformes + Podicipediformes was aquatic, rather than a wader. However, the earliest members of the flamingo group, *Juncitarsus gracillimus*, from the Eocene of North America and the contemporaneous *J. merkei* of Europe, were small, colonial, wader-like birds inhabiting saline environments (Feduccia 1996). Mayr suggests that further study may reveal the juncitarsids to be the sister-group to the flamingos + grebes, rather than being ancestral, if they are closely related to these two groups at all. The next oldest in terms of fossils are the Phoenicopteridae, with representatives in the Early Oligocene of France. The most surprising discovery, however, is the existence of several species in Australia, as well as a species of *Phoeniconaias* (*P. siamensis*) from the Miocene of Thailand. An Australian species which also belongs in this genus, *P. gracilis*, lived in the Lake Eyre region in the Early Pleistocene, and is the youngest flamingo known from that continent. Another Australian flamingo, the Late Oligocene/Early Miocene *Phoenicopterus novaehollandiae*, was a member of the most widespread genus today. *Phoenicopterus*, is the most speciose genus in the family generally, including several fossil representatives in the New World. Flamingos can be recognised by their extraordinary long legs and neck combined with a deeply decurved bill specially adapted to filter-feeding. In contrast, the closely-related Palaelodidae possessed a short, straight bill. Like the Phoenicopteridae, they were probably planktivores, but had a more primitive morphology. In some areas, the palaelodids were extremely common and, like the Phoenicopteridae, were highly colonial. For instance, at least 477 individuals of *Palaelodus ambiguus* have been recovered from the Miocene deposits of St Gerand-le-Puy, France, along with large numbers of bones of three other species (see Feduccia 1996). Also like the Phoenicopteridae, the Palaelodidae have been found in Australia (*P. kadimakari*), in Europe and in North America, where the second genus in the family, *Megapalaelodus*, also existed.

The other long-legged waders are collected in the order Ciconiiformes. The most distinctive are probably the herons, the earliest fossils of which are already characteristically ardeid; these are *Proardea amissa* from the Upper Oligocene of Europe (Mayr 2005a), and *Calcardea juniei* from Eocene deposits in North America. Two other families, described as 'aberrant African forms' by Feduccia (1996), the Hamerkop (Scopidae) and the Shoebill (Balaenicipitidae), may actually be close relatives to the pelicans (Mayr 2003c, van Tuinen *et al.* 2001), rather than having a close relationship with other Ciconiiformes (*contra* Feduccia 1977). The fossil record of these two families lends nothing to the debate: that of Balaenicipitidae is too fragmentary, although one species, *Paludavis richae*, does extend the family's range into the Oriental region (Harrison & Walker 1982); that of Scopidae consists of one Early Pliocene species from South Africa, *Scopus xenopus*, 'slightly larger than the living species' (Feduccia 1996). Within traditional classifications, it is the Ciconiidae that are regarded as the closest relatives of the Shoebill, while the Hamerkop is of unknown relationships.

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#### Podicipediformes

17 fossil species, 7 genera

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#### Phoenicopteriformes

34–35 fossil species, 12 genera



Flamingos have undergone radiations of two rather different body forms. One group, the Phoenicopteridae, exhibits long legs and neck combined with a highly modified, bent bill containing a specialised sieving mechanism. The other group, the Palaelodidae, had a straighter bill and were better adapted to swimming, although they still had a comparatively long neck. Several species are known, from different continents. The discovery of bone beds of the European *Palaelodus ambiguus* shows another side to the palaelodids: like their extant cousins, they appear to have been highly colonial birds, probably often mixing with other members of the Phoenicopteriformes at particular sites.



## Ciconiiformes

72–75 fossil species, 59–60 genera



Originally misidentified as a shorebird, *Rhynchaetites messelensis* is now regarded as the oldest substantiated fossil ibis, with several specimens known from the Middle Eocene of Messel. It differed from modern species in many ways, including the morphology of the chest bones and its very short tarsometatarsi, as well as its very small size.

## Anseriformes and relatives

187–195 fossil species, 78–80 genera



The Hawaiian Islands were at one time home to ducks that had evolved into giant, flightless, goose-like birds. The most widespread of these 'moa-nalo' was *Thambetochen chauliodous*. There is evidence that these birds occupied a specialised browsing niche, indicated by the unusual morphology of the jaws, in that they had bony pseudo-teeth and modifications to the head and neck (Olson & James 1991).

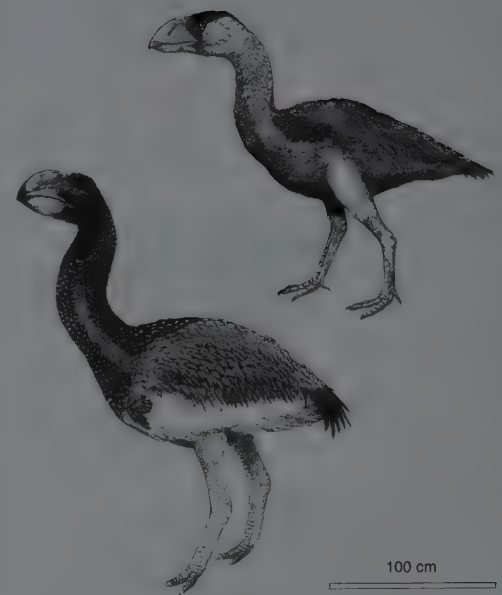
The storks themselves are also suggested to be derived relatives of the cathartid vultures. The earliest species of stork known to date, *Palaeoephippiorhynchus dietrichi*, comes from the Late Eocene to Late Oligocene deposits of the Fayum series of Egypt (Boles 2005b, Feduccia 1996, Mayr 2005a); the exact age of this species appears to be contentious. Likewise, the Middle Eocene Chinese 'stork', *Eociconia sangequanensis* (Hou 1989), needs confirmation before it can be claimed as the earliest ciconiid (Unwin 1993), while a number of other potential 'storks' are too fragmentary to be identified properly. Of the later species, *Leptoptilus falconeri* is of particular interest, as the distribution of this giant marabou stretched across north Africa, Eurasia and into India. At 2 m in height and weighing an estimated 20 kg, this was one of the largest of the storks. Being predominantly terrestrial, *L. falconeri* probably had slightly reduced forelimbs, leading to a marginal reduction in flight ability (Louchart, Vignaud *et al.* 2005). Another giant stork, originally described as a *Mycteria*, is *Ciconia maltha*, a North American species from the Upper Pliocene and Pleistocene that possessed a large size range, from smaller than the wood-stork to larger than the Jabiru (Miller 1932). Fossil ibises are equally spectacular, with those of particular interest originating from the extremes of the fossil and subfossil record. The earliest identifiable ibis, the German *Rhynchaetites messelensis*, is also the smallest member of the family. This species is famous for its short metatarsus, which it shares with another, as yet, undescribed species from France (Mayr 2005a). At the other end of the timeline are a number of insular flightless species, with *Xenicibis xympithecus* from Jamaica (Olson & Steadman 1977) and two species of *Apteribis* (*A. glenos* and *A. brevis*) from the Hawaiian Islands. These ibises had short stout legs and, when their bones were first discovered, their identity as members of the Threskiornithidae were obscured; indeed, *Xenicibis* was originally described as a relative of the sloths and anteaters, rather than a bird! When the bones of the Hawaiian species were first examined, they were said to resemble most closely kiwis: it is thought that these birds searched the leaf litter for invertebrates much in the way that kiwis do today.

Another waterbird group, Anseriformes, is one of the best represented orders in the fossil record, with nearly 200 described fossil species of ducks, swans and geese. It is also one of the most widespread orders, with examples from all over the globe and from as far back as the Cretaceous. Early species were comparatively small, duck-like animals, while later species often became gigantic and flightless, particularly island forms. The earliest representatives are clustered within the Presbyornithidae, and bear many superficial similarities with the whistling ducks. The skull of *Presbyornis* bears a close resemblance to *Stictonetta*, a basal species within the Anatidae (Olson & Feduccia 1980). Like many early groups, their relationships have come under severe scrutiny, with affiliations suggested with the flamingos, and the shorebirds and even such enigmatic groups as the Graculavidae, which led Feduccia to conclude that Early Paleocene birds all stem from a possible shorebird mosaic group with morphological similarities to a number of modern orders, be they ducks (as in the case of *Presbyornis*), ibises (for example the Messel 'rail-ibis', *Rhynchaetites*), or even flamingos (*Juncitarsus*). However, such a proposal has been rejected by many in the palaeontological and molecular communities (e.g. Dyke & van Tuinen 2004, Paton *et al.* 2002, van Tuinen *et al.* 2003), although Feduccia has since countered these arguments (Feduccia 2003a, 2003b). Even so, recent studies have moved the Presbyornithidae into the Anatoidea, as a group basal to the Anatidae (Ericson 1997), which must cast further doubt on this 'transitional shorebird' hypothesis. Presbyornithids were a widespread group, with examples from sites across the Northern Hemisphere. The most abundant fossils are of *Presbyornis pervetus*, a colonial, sexually dimorphic species from Eocene deposits of Utah and Wyoming (Ericson 2000). Another species, *P. isoni*, was a giant relative. Originally described from a single humerus from the Upper Paleocene of Maryland, it has now been found at other sites in North America and possibly also Britain (Benson 1999, Olson 1994). *Teviornis gobiensis*, another giant presbyornithid, but from Upper Cretaceous deposits in Mongolia, is also worth mentioning as it pushes the group—and, indeed, the Anatoidea generally—back before the infamous K–T boundary, thereby presenting important evidence that the Neornithes do have origins in the Mesozoic, rather than appearing after the K–T cataclysm (Kurochkin *et al.* 2002). Other ducks have been described from this period, most notably *Vegavis iaai* from the Antarctic Peninsula. However, these Cretaceous fossils are all very fragmentary, and can provide only 'tantalising indications', rather than irrefutable evidence (Clarke *et al.* 2005, Dyke & van Tuinen 2004, Noriega & Tambussi 1995).

The other notable proliferation within the fossil Anseriformes is of flightless forms. Many are island species, such as the giant swan *Cygnus falconeri*, uncovered from the European Pleistocene (Northcote 1982), but coastal examples also exist, for example the Californian 'diving goose' *Chendytes lawi* from the Late Pleistocene (Howard

1947, Miller 1925). New Zealand had a number of recently extinct anatids, many of which, again, were flightless. This avifauna included two *Cnemiornis*—giant, 1-m tall, goose-like birds—of the North (*Cnemiornis gracilis*) and South Islands (*C. calcitrans*), possibly related to shelducks, but with their modern ecological equivalent being the Cape Barren Goose (*Cereopsis novaehollandiae*) of southern Australia. However, it is the islands of Hawaii that have revealed the most bizarre forms. Here, primitive dabbling ducks (Anatinae) radiated through the early islands, evolving into large flightless, terrestrial ‘geese’ (Sorenson *et al.* 1999). Called ‘Moa Nalo’ in the native Hawaiian, these birds foraged in the forests, feeding on a variety of herbage. Four species have been described, belonging to three genera, including *Thambetochen* and *Ptaiochen*, with *T. chauliodous*, the most widespread species, from Molokai, Oahu and Maui, a related species, *T. xanion* found only on Oahu, and *P. pau* from Maui (Olson & James 1982). One species, *Chelychelynechen quassus*, had a bill particularly modified for such browsing, to the extent that it resembled more the jaws of a turtle than a duck’s bill, hence the popular name for the species, ‘Turtle-billed Moa-nalo’ (Olson & Wetmore 1976). Like 90% of the birds that were found on the Hawaiian islands, their demise occurred with colonisation by the Polynesian people. The Moa Nalo, like many island species worldwide, such as the Dodo (*Raphus cucullatus*), had no experience of such a successful terrestrial predator as *Homo sapiens*, nor of the other threats that came with him, so they had no way to cope with the onslaught; as a result, many species were wiped off the face of the earth within comparatively few years.

In 1881 a very different type of bird was described by Lemoine from Paleocene/Eocene deposits in France. Although missing much of the skeleton, he concluded that this was a huge animal, taller than a man. This he named *Gastornis parisiensis*. However, his reconstruction included a substantial amount of material that was not even avian (Martin 1992). For a long period, these birds were considered relatives of the terrorbirds—giant predatory ‘seriemas’ in the order Gruiformes from the Americas. It was not until a century after Lemoine’s description that his species and its relatives, known collectively as the Gastornithidae, were placed close to the Anseriformes (Andors 1991) and were identified as sharing a close relationship with the American *Diatryma* (Olson 1985)—so close, in fact, that the latter is now included in *Gastornis* (Buffetaut 1997). *Gastornis* (*‘Diatryma’*) *gigantea*, the most famous of the group, was a giant flightless bird, at least 2 m tall, found in North America during the Early Eocene, 58–51 mya, while its relatives lived in Europe throughout the Late Paleocene to Middle Eocene, 62–43 mya, at least. Fragmentary fossils indicate that gastornithids may have survived until about 40 mya. Examples were also present in Eocene Asia, in the form of *Zhonguanus xichuanensis* (Hou 1980), but this bird was a more primitive form to that of its larger cousins (Andors 1992). As much controversy surrounds how the birds lived as with their relationships. They were originally portrayed as terrifying giant predators that ran down and fed on the various mammals that were around during the early Tertiary. In 1991, Andors cast doubt on this long-held portrayal, pointing at the absence of a hook on the huge beak, the short toes and a physical appearance that made the animal far too heavy and large to be able to run down anything (Andors 1991, 1992)! Instead, he presented the bird as a particularly large browsing animal, feeding on bushes and shrubs in the lowlands and floodplains, comparing it in part with modern herbivorous species such as New Zealand’s surviving Takahe (*Porphyrio mantelli*), which also has a large bill. Even so, counter-arguments still exist suggesting that this was a giant predator that, although slow compared to modern predators, was still able to tackle those animals not in the prime of life through age, sickness or injury, whilst also scavenging on their remains (Witmer & Rose 1991). The same arguments also surround the mihirungs or ‘thunderbirds’ (Dromornithidae), another group of giant flightless birds rather ratite-like in form, and also now thought to be early offshoots of the Anseriformes (Murray & Megirian 1998), although their exact relationships with other basal groups, namely the Magpie-goose (*Anseranas*) and the screamers (Anhimidae), are still under question. The mihirungs occurred only in Australia, occupying a variety of niches (Murray & Vickers-Rich 2004). To date, eight species have been described, the youngest being the Pleistocene *Genyornis newtoni*, the oldest being the Late Oligocene/Early Miocene *Barawertornis tedfordi*. Trace and fragmentary fossils indicate that the dromornithids may have been around at least since the Eocene. The mihirungs included amongst their number one of the largest birds that ever lived, *Dromornis stirtoni*, standing at 3 m in height. Two species within this family are particularly interesting: one, *Genyornis newtoni*, may have come into contact with modern humans, with its extinction being connected with the spread of the aboriginal peoples through Australia. The other is the 15 million year old *Bullockornis planei*, because a lot of work has gone into examining whether this giant-billed animal fed on meat or plant material. Indeed, the latter species has been labelled in the popular press as the ‘Demon Duck of Doom’ (Pain 2000, Wroe 1999)!



The Gastornithidae and Dromornithidae were two families that contained giant, heavyweight birds with very large heads, huge beaks and powerful mandibular muscles, as seen in *Gastornis gigantea* (syn *Diatryma gigantea*), a species 2 m tall, found in the Eocene of North America (above), and *Bullockornis planei* (below), a dromornithid standing 2.5 m tall, from the Pliocene of Australia. The major authors in the field regard the Dromornithidae as being primarily herbivorous, a view that has been mirrored by studies on the gastornithids by Andors (1991, 1992).





The Du, *Sylviornis neocaledoniae*, was a giant 'megapode' from the island of New Caledonia. Described as a ratite by François Poplin in 1980, it was likened in size to a small emu, with ornamentation on its head 'like a cassowary's' (although not shown like this in the sketches of later publications). It was not till the mid-1980s that its identity as a megapode was realised (Mourer-Chauviré & Poplin 1985, Poplin & Mourer-Chauviré 1985). Its extinction is thought to have been at the hands of the human inhabitants of this island.

However, Murray and Vickers-Rich have maintained that because the mihirungs are basal anseriforms, they must have been predominantly herbivores. They argued that the mihirungs grew huge in response to the need to travel large distances between food patches. Physical evidence for their herbivory exists in the possession of large gizzard stone sets, together with, at best, a small terminal hook, both features that indicate a herbivorous, rather than carnivorous, diet (Murray & Megirian 1998). So, instead of meat, they may have fed on twigs, fibrous vegetation and hard-shelled seeds. The most unusual feature of the family are their toe claws, which have been drastically modified, becoming far more nail-like than any other bird species. These are not the raptorial claws of predators. The modification is so extreme that these 'nails' have been likened to the hooves found on cattle, with the mihirungs often being described as the only hooved birds on the planet (Vickers-Rich 1980).

There is general agreement among palaeontologists and molecular biologists that the Galliformes are the closest living relatives of the wildfowl and their kin. Like that group, the Galliformes have an extensive fossil record. The earliest examples were members of the now extinct Gallinuloididae, a group of basal 'landfowl' found across North America and Europe. Of these birds, the most intensively studied is *Gallinuloides wyomingensis*, even though it is known from only two specimens, both from the Lower Eocene deposits of the Green River Formation of Wyoming (Mayr & Weidig 2004). This was a small bird, about the size of a quail, but with relatively long legs and which probably had the appearance of a small cracid in life, as comparisons have been made in the past with that family (e.g. Olson 1985), even to the point of *Gallinuloides* being included in the family (e.g. Tordoff & Macdonald 1957). However, these characteristics are currently regarded as primitive traits in the Galliformes, rather than showing a true relationship between the two groups (Dyke 2003, Mayr 2005a, Mayr & Weidig 2004). A related species, *Paraortygoides messelensis*, has revealed two features about the gallinuloidids (Mayr 2006a): first, they are the sister-group to all other galliform birds, living and extinct; and, second, a large crop, characteristic of all other Galliformes, is absent in gallinuloidids. This latter feature—or, rather, its absence—suggests that the gallinuloidids fed only on soft plant material, rather than seeds and other coarse matter. Another basal galliform group, the Quercymegapodiidae, were also misinterpreted at one time as belonging to an extant group, in this case the primarily Australasian Megapodiidae. However, like the Gallinuloididae, the traits suggesting this relationship are now interpreted as plesiomorphic, and that there is no basis for the suggested relationship, other than that they are both galliform. Currently, members of the Quercymegapodiidae are known from Europe, from where the type genus *Quercymegapodius* was described, as well as from deposits in the Miocene of Brazil. A number of present-day groups within the Galliformes are also of interest, including some members of the more primitive groups, Cracidae and Megapodiidae. One of these is the famed Du (*Sylviornis neocaledoniae*), a flightless giant 'megapode' from New Caledonia; although usually included in Megapodiidae, it is regarded as being so aberrant as sometimes to be placed in its own family, Sylviornithidae. Reconstructions of the species show a bird almost three times the size of the modern Malleefowl (*Leipoa ocellata*) with a comb wattle on its head, the latter feature gleaned from the oral tradition of the islanders (see Feduccia 1996). This species was exterminated in the early Holocene by the first human colonists, like so many other island species in the Pacific and elsewhere. It was not the only giant megapode, as these existed elsewhere in Australasia at about the same time, with the flightless *Megavitiornis altirostris* from Fiji rivalling *Sylviornis* in size (Worthy 2000), and *Leipoa gallinacea* from Australia itself. While the story of the megapodes is one of expansion and diversification on many different islands and within Australia, that of the cracids of the Americas is one of a northerly origination, followed by a retraction, perhaps due to competition with other Galliformes, into the Neotropics. *Procrax brevipes*, for instance, was a bird from the Lower Oligocene of South Dakota (Tordoff & Macdonald 1957). The genus *Ortalis* was present in the Lower Miocene of Nebraska, through *O. tantala*, a small guan half the size of the modern species *O. vetula*; and the Middle Miocene of South Dakota, through *O. pollicaris*. Of the other Galliformes, it is perhaps surprising to discover that there was an abundance of turkey species in the past, including some tiny species. The miniature turkey *Rhegminornis calobates*, for instance, was so small that when it was discovered in Florida it was described as a jacana (Wetmore 1943a), and it was not until 1974 that its true identity as a Lower Miocene turkey was announced by Olson & Farrand. Other species within the group included members of *Proagriocharis* and *Parapavo*, as well as additional members of the two modern genera, together raising the family diversity to about 11 species. The Phasianidae and Tetraonidae also have many fossils, but these consist mainly of range extensions for genera still present today: for example, members of the genus *Gallus* have been discovered as far west as the Caucasus, in Georgia, while the genus *Pavo* had a repre-

sentative, *P. bravardi*, in the European avifauna during the Upper Pliocene (Boev 2002, Mourer-Chauviré 1989a).

Raptorial birds have evolved several times throughout the fossil record, both within the toothed birds (e.g. *Boluochia* of the Enantiornithes) and within modern birds. The most obvious of these latter groups are the so-called 'raptors', currently within the order Falconiformes. However, this grouping is artificial, forcing together two groups of birds of very different origins. That of the Accipitridae and their relatives is still ambiguous. In the case of the Cathartidae, both molecular and morphological work point to an ancestry shared with the storks (Ciconiidae), rather than falconiform raptors. The oldest fossil in the group, that of the small *Diatropornis ellioti*, comes not from the Americas, but from the Quercy Fissure deposits of France, and is Late Eocene to Early Oligocene in age (Cracraft & Vickers-Rich 1972, Mourer-Chauviré 2002). Two other species come from early in the history of the Cathartidae: one, *Phasmagyps patritus*, originates from the Early Oligocene of Colorado, and therefore comes from within the range of modern species. The other, *Oligocathartes olsoni*, is from the Lower Oligocene of England. However, Mayr (2005a) regards the latter as too fragmentary to be identifiable and perhaps this species should be removed from the Cathartidae. Although the origins of the family may not have been in the New World, or, at least, their origins may have been shared with Europe (as seems to be the case with many groups), the majority of species are from the Americas. *Hadrogyps aigialeus* represents a small stocky 'condor' from the Middle Miocene of California and was probably a coastal species (Emslie 1988), while the next 'large condor' is the Late Miocene/Early Pliocene *Perugyps diazi*, from the Pisco formation of Peru. Together, this suggests that condors evolved in North America and spread to South America by the Late Miocene (Stucchi & Emslie 2005). Cathartid vultures were at their most diverse in the Pleistocene, when several species of condor existed in North America. The formerly widespread *Gymnogyps californianus*, which we call the 'California Condor', had a range that stretched throughout the USA in the Late Pleistocene, but its range contracted with the progressive extinction of the North American megafauna (Steadman & Miller 1987). Another species, *G. kofordi*, was described from the Early Pleistocene of Florida, while a larger form of the modern species, *G. californianus amplius*, was exhumed from the La Brea tar pits, California. In addition, a closely-related condor, *G. varonai*, was found in Late Pleistocene deposits of Cuba. Alongside the Cathartidae in the Americas was another vulture-like group, the teratorns (Teratornithidae). Three of the four species were North American, the exception being *Argentavis magnificens*, whose fossil was discovered in Late Miocene deposits of Argentina, and which must have been a huge bird, with a wingspan of 6–8 m. Indeed, *A. magnificens* is considered to be the largest flying bird ever to have lived. Not only was this the largest of the teratorns, but it was also the oldest (Campbell & Tonni 1983), although it was not the first species in the family to be described. That honour goes to *Teratornis merriami*, which was also the most abundant of the group. *Teratornis* was a species whose temporal range extended from the Pliocene until the Late Pleistocene. It is probably typical of the group in many ways. Merriam's Teratorn, as it has been named, was also a large bird, but only half the size of *Argentavis*, having a wingspan of a mere 3–4 m; if one compares this with the Andean Condor (*Vultur gryphus*), which can attain a span of about 3.2 m, one can begin to see the true size of these birds. Traditionally, the teratorns have been portrayed as giant versions of the Cathartidae, even sharing their scavenging habits, a perception reinforced by the shape of the skull and by discovery of over a hundred individuals of *T. merriami* in the asphalt deposits of La Brea, a site that has produced hundreds of fossils of raptors and vultures, all thought to be attracted to the animals that became trapped there. However, instead of being scavengers, teratorns are now considered to have been active hunters, with *T. merriami* being a fish-eater and facultative scavenger (Hertel 1995). In the air, these birds may have soared like condors, but on the ground they were apparently more agile: in the smaller teratorns such as *T. merriami*, this agility may have helped them in their attempts to take off. How the giant *A. magnificens* took off is a matter for conjecture, but the age of the deposits in which it was found and the geographical position of the site indicate that its flight was enabled by the constant strong winds that crossed the South American plains in the Late Miocene, unhindered by the Andes, which were, at the time, undergoing upheaval. Another deduction from the age of this specimen is that teratorns probably evolved in South America, later spreading north into North America, before finally dying out at the end of the Pleistocene.

Just as cathartids have been found in the Paleogene deposits of Europe, so have true vultures been discovered in North America. The most diverse of these New World 'Old World' groups were the neophrons (*Neophrontops* spp.). Fossils of *Neophrontops americanus*, the first species to be described, have been found in Middle and Late Pleistocene deposits of western North America. It is one of the most recent species in

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Cathartidae & Teratornithidae  
21–22 fossil species, 16–18 genera

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The most famous of the fossil cathartids is the Upper Pleistocene La Brea Condor (*Breagyps clarki*). This was one of the larger members of the New World vulture guilds and may have survived into the early Holocene. It is thought that *Breagyps* represents one of the 'gulper' type vultures, and is therefore a guild equivalent to the contemporaneous California Condor (*Gymnogyps californianus*) and the unrelated African White-backed Vulture (*Gyps africanus*).



*Teratornis merriami* is the best known and commonest of the Teratornithidae. With a wingspan of 3.5–3.8 m, it dwarfed its cathartid cousins, yet was one of the smallest members of its own family. Reconstructions of teratorns have shown the birds as giant condor-like birds, because they were originally thought to be close cathartid relatives, with a similar predilection to scavenging. However, recent papers have shown that these birds—or, at least, *T. merriami*—were more likely to be predatory birds, while, phylogenetically, Campbell & Tonni (1983) point out that they might be just as closely related to storks as they are to the New World vultures. Both factors would alter the interpretative reconstruction of the teratorns, giving them a more distinctive look than has previously been portrayed.

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Falconiformes (excluding  
cathartid vultures and teratorns)  
121–122 fossil species, 60–61 genera

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the group: the oldest is probably *N. vetustus*, from the Middle Miocene of Nebraska (Wetmore 1943b), which is also the smallest. *N. americanus* is fairly typical of the American Neophrons and suggests that they were most similar to, and probably ecological equivalents of, the Egyptian Vulture (*Neophron percnopterus*), with *N. americanus* being very similar in size to the modern *Neophron*. Feduccia goes further than this, stating that the Egyptian Vulture's lack of a fossil record and the similarity between the two genera 'strongly suggests that the genus' [= *Neophron*] 'is derived from an invasion of the Old World by New World *Neophrontops* stock, possibly as late as Pleistocene time' (Feduccia 1974). While *Neophron* may be of American origin, that of the other Old World vultures can equally be American or Old World: the oldest fossils for the group include *Palaeohierax gervaisii* from the Oligocene/Early Miocene of Europe and *Palaeoborus rosatus*, from the Early Miocene of South Dakota. Apart from *Neophron* and its relatives, vultures are among the largest of the living raptors. However, there are notable examples in the fossil record of eagle-like forms of gigantic proportions, truly terrors of the air! Among these, and probably the most famous, is Haast's Eagle (*Hieraaetus moorei*) from the South Island, New Zealand (see Worthy & Holdaway 2002, for an extensive description). Until recently, the species was listed as *Harpagornis moorei*, but recent molecular research (Bunce *et al.* 2005) has shown that the closest relatives among those eagles studied were the Booted (*Hieraaetus pennatus*) and Little Eagles (*H. morphnoides*), the latter an Australo-papuan species with a wingspan of only about 1 m and a weight of 0.5–1.3 kg. *Hieraaetus moorei*, on the other hand, had a wingspan of 2–3 m, with females weighing 10–15 kg—an order of magnitude larger than extant *Hieraaetus*, and 30–40% larger than the Harpy Eagle (*Harpia harpyja*), the largest extant eagle. The main reason why this bird became so large becomes apparent when examining the ecology of prehuman New Zealand, for this was a land without any land predators and with only a few bird predators, included among diurnal species being an endemic species of harrier (*Circus eylesi*), also now extinct, a hawk and a falcon (Holdaway *et al.* 2001). Additionally, without mammalian predators, the herbivorous birds of New Zealand grew to massive proportions, most notable being the moas. Thus, the eagle's huge size was a response to a combination of competition with the resident raptors, a lack of competition with mammalian predators and the size of prey potentially available. Marks on the bones of moa up to 200 kg suggest that the eagle ambushed these large birds in forested and scrub areas, striking and gripping the moa's pelvic area, then killing with a single strike of the powerful foot to the neck or head. Giant eagle-like raptors have been found on islands elsewhere, for example *Stephanoaetus mahery* of Madagascar, which, like *H. moorei*, was present until fairly recent times, and the appropriately named *Titanohierax borraasi* of Pleistocene Cuba. In each case, it is the lack of large mammalian predators and the availability of large prey that induces the evolution of gigantism in the respective avian top predators. The fossil record reveals several other hawks and eagles, from island forms to species in genera that today are regarded as tropical or southern endemics but which were found much further north in the past, for instance, in the Americas, *Spizaetus* and *Buteogallus*. This is also the case with the secretarybirds (Sagittariidae), in which two of the three fossil species known, *Pelargopappus schlosseri* from the Middle to Late Oligocene and *P. magnus* from the Early Miocene, were found not in Africa, as one would have expected, given the distribution of the extant species, but in France, indicating the modern species to be relictual (see Mourer-Chauviré 2003 for the first African birds). Compared to *Sagittarius*, the foot bones of *Pelargopappus* were more accipitrid-like in form. Mayr (2005a) has suggested that this is because the Sagittariidae are derived from the same ancestral group as the Accipitridae, and that the accipitrid characteristics observed are due to the more primitive nature of this genus, although Mourer-Chauviré & Cheneval, 1983 had previously considered the genus to be too advanced to be the ancestor of recent Sagittariidae. The morphology of the Sagittariidae, with their long legs and eagle-like bodies and head, is fairly bizarre, even when accounting for their rather specialised hunting strategy, but it is not unique: similar morphology was exhibited by an American accipitrid, *Apatosagittarius terrenus*, the fossils of which were uncovered from the Miocene of Nebraska (Feduccia & Voorhies 1989), suggesting that this species had adopted similar hunting methods.

Unlike the accipitrids and sagittariids, the origins and diversity of the Falconidae appear to be American, with a caracara-like falcon, *Badiostes patagonicus*, known from the lower Miocene of Patagonia, while several species belonging to the modern Polyborinae and Falconinae have also been described from North America. The earliest European record is of a species of *Falco* from the Late Miocene. A close relative of the Falconidae, *Pediohierax ramenta*, is known from the Middle Miocene of Nebraska. The falcon-sized *Horusornis vianeyliaudae*, described from the Upper Eocene of the Quercy Fissure Formations of France (Mourer-Chauviré 1991) brings up an interest-

ing conundrum. Ecologically, it occupied the same niche as *Polyboroides* of Africa, *Geranospiza* of the Neotropics and *Pengana* from Tertiary deposits in Australia in that it could flex its leg backwards, thereby enabling it to 'grope around in tree cavities or hollows for nestlings or small mammals' (Feduccia 1996). From the evolutionary standpoint, its relationship to the other falconiform groups is ambiguous, as *Horusornis* shares features of its wing bones with the Accipitridae, and derived characters of its foot bones with the Accipitridae and Falconidae. These features alone would suggest that *Horusornis* is derived from the same ancestor as the Accipitridae and Falconidae. However, the distal end of its tibiotarsus bears similarities to that of owls, which clouds the issue. Such 'mosaic species' are, however, not that unusual.

The unique Hoatzin is one such species and consequently has had a chequered history with respect to studies on its phylogenetic relationships. It has been described as a primitive galliform, a member of the gruiform radiation, placed in its own order and has even been connected with the cuckoos. Recently, Hughes (2000) has suggested that the turacos (Musophagidae) should be placed alongside the Hoatzin in the order Opisthocomiformes: they are the only extant families in which the young of some species have a well-developed wing-claw. Hughes also remarked that the Lower Eocene *Foro panarium*, a ground-based bird found in Wyoming, seems to confirm this placement, as this species 'has a skull and mandible most like the Hoatzin, but shows some similarities to turacos in postcranial skeletal elements'. However, she suspected *Foro* to be a separate lineage that may stem from the same ancestor as the cuckoo and hoatzin + turaco lineages, which would agree with Olson's placement of the bird in its own family, Foratidae (Olson 1992b). True hoatzins are South American and are found much later in the fossil record, with the Miocene *Hoazinoides magdalenae* not only laying claim to being the first hoatzin fossil to be described (Miller 1953), but also representing the most westerly occurrence in the family. Unfortunately, only part of the skull was found and, although very hoatzin-like in form, little else can be told of the bird, other than that it was less specialised than the modern species.

The Gruiformes are another group in which the relationships are not at all clear. Unlike the Opisthocomiformes, their fossil record is extensive, with several families present only as fossils. The Gruiformes have their fair share of giants, with the peculiar adzebills of New Zealand, and the aptly-named terrorbirds of the Americas. Possibly unsurprisingly, there are also a large number of fossil and subfossil rails, many of which disappeared at the hands of humankind. Among the earliest of the Gruiformes are the Messel-rails (Messelornithidae), which Mayr (2004g, 2005a) regards as related to the finfoots (Heliornithidae) and rails (Rallidae). Earlier authors (e.g. Hesse 1988, Livezey 1998) included them alongside the Sunbittern (*Eurypyga helias*) of the Neotropics. The family includes four species, the earliest of which, *Messelornis russelli*, occurred in the Upper Paleocene of France (Mourier-Chauviré 1995a). The family also occurred in North America, in the form of *M. nearctica* (Hesse 1992). The most famous member of the group, described in a monograph by A. Hesse in 1988, is *M. cristata*. This bird is known from a large number of fossils, originating from various Eocene/Oligocene sites in France and Germany, including Messel itself. Some of the articulated fossils of this species include a fleshy or horny crest preserved as an impression. None of the other species have shown the possession of a crest.

The adzebills (Aptornithidae) of New Zealand are another enigmatic group, but of much more recent occurrence. In fact, these birds existed until as recently as 1000 years ago; like so many Polynesian species, they succumbed upon the arrival of humans and their animal associates (Gill & Martinson 1991). These flightless giants have been portrayed as bizarre takahe-like "rails" with large, downcurved bills and stout feet that enabled them to dig out petrel burrows, turn over litter, tear open rotting logs etc. in order to feed on large invertebrates, lizards and even tuatara and petrels (Holdaway 1989), or feed on berries, dig up tubers (Gill & Martinson 1991), or tear off pieces of tussock-grass (Feduccia 1996). In summary, they possessed a variable diet that changed between inland, montane and coastal sites. Two species are recognised, one for the North Island (*Aptornis otidiformis*), occurring in vegetation mosaic areas of open scrub, forest and grassland (Worthy 1999, Worthy & Swabey 2002) and a larger species (*A. (o.) defossor*) from more open, scrubland, sites on the South Island (Holdaway 1989, Worthy 1998, Worthy & Holdaway 1995). The latter species stood at 80 cm in height, roughly the same size as a male Great Bustard (*Otis tarda*) and that of *Pachyornis*, the second largest of the moas. It is the bill that has attracted the most interest, and has given the two species their common name, due to the very superficial similarity to the carpenter's tool of the same name. The most recent study (Houde *et al.* 1997) indicates that the adzebills may be basal to the rail lineage, although other studies suggest relationships with the Kagu of New Caledonia. Aptornithidae is one family whose position is still unclear: one study has even come up with the suggestion

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Opisthocomiformes and Foro  
3 fossil species, 3 genera

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Gruiformes  
221–225 fossil species, 109 genera



The Messelornithidae of the early Tertiary were, until recently, thought to be related to the Sunbittern of the Neotropics. However, Gerald Mayr (2004g) of the Forschungsinstitut Senckenberg considers the group to be most closely related to the finfoots and rails. Of the four species so far identified, *Messelornis cristata* is the only one known to possess a fleshy or horny comb.



that they may not be gruiform at all, but, instead, may be distant relatives of the Anseriformes and Galliformes (Weber & Hesse 1995).

The Cariamoidea would also appear to be an aberrant offshoot within the Gruiformes. However, this is deceiving, for, as well as being as old as the Messelornithidae, the fossil record shows a group that was more speciose than the two species we see now. The group consists of four families: Cariamidae (the only extant family); Idiornithidae; Bathornithidae; and Phorusrhacidae. Cariamidae has one valid species in the fossil record: *Chunga incerta*, from the Pliocene of Argentina. An Oligocene species has also been listed, but its relationship with the Cariamoidea has been called into question (Mourer-Chauviré 1981, Olson 1985). The Idiornithidae, predominantly from the Middle Eocene and Early Oligocene of Europe and Asia, and the Bathornithidae, from the Late Eocene and Early Oligocene of North America, are two associated groups that have been treated as subfamilies of the Cariamidae (as per Mourer-Chauviré 1981). The Bathornithidae have a chequered history, with the original specimens being allotted to the Cathartidae, Rallidae and Burhinidae, only being combined and elevated to family status in 1933 (by the original author, A. Wetmore). It was not until 1968 that the family finally found its proper placement alongside the Seriemas (see Olson 1985 for a more complete summary). The Bathornithidae includes two genera: *Bathornis*, which includes *B. grallator* from the Late Eocene of Wyoming, a bird originally described as a 'terrestrial vulture' by Wetmore in 1944; and *Paracrax*, including *P. gigantea* from the Late Oligocene of South Dakota. Within the related Idiornithidae, the genus *Elaphrocnemus* is of particular interest, as the wing elements were 'almost perfectly intermediate between the seriemas and hoatzins' (Olson 1985), leading to his conclusion that the Opisthocomidae and the Cariamoidea were related, a conclusion also reached by Mourer-Chauviré (1981). The Cariamoidea evolved on open grasslands as predatory birds, running down smaller prey from reptiles and other birds to mammals of various types. Some species may also have scavenged. The elegant, long-legged seriemas are one end of the extreme, while the phorusrhacid terrorbirds are the other, some reaching gigantic proportions, their most notable feature being a large head and high-ridged bill. Alvarenga & Höfling re-examined the classification of the terrorbirds in 2003 and concluded that the Phorusrhacidae occurred purely in the Americas. Most of the 17 species so far identified were South American, the majority inhabiting the pampas and dry grasslands of Argentina and Brazil; the exception is *Titanis*. Their origins are suggested to be in the Late Cretaceous or Early Paleocene, when South America was still an island continent. However, the earliest known species is the turkey-sized *Paleopsilopterus itaboraiensis* from the Middle Paleocene of the Argentinian Pampas, which suggests that other species are yet to be discovered. The family lasted until the Late Pliocene, when they had reached as far north as Florida and Texas, through the 2-m tall *Titanis walleri* (MacFadden *et al.* 2007). In the past, the family was also thought to have examples in Europe. However, these two fossils, *Ameghinornis* and *Aenigmavis*, have been removed from the Phorusrhacidae. The former was redescribed as a probable idiornithid and the latter as 'Aves: *incertae sedis*', with the suggestion that *Aenigmavis* was an arboreal, rather than a purely terrestrial, species (Mourer-Chauviré 1981). This observation in itself should have made people suspicious, given the terrestrial nature of the rest of the family. Gerald Mayr (2005b) has since reidentified both these specimens as belonging to *Strigogyps*, a member of the owl radiation, and therefore not even a cariamoid, although this has been countered by Peters (2007). Problems with identification aside, the phorusrhacids have proven to be an interesting family of predatory birds. As with others in the group, these ground-birds were generally built for speed, with members of the subfamily Phorusrhacinae being the top predators of the grassland and sparse scrubland areas they occupied. Those of the Brontornithinae were at least partial scavengers. Studies examining the locomotory abilities of these animals have estimated that the giants of the family, the Phorusrhacinae, could attain speeds of up to 50 km/hour (31 mph), while smaller species, such as the Argentinian *Mesembriornis milneedwardsi* from the Upper Pliocene, may have been even faster, with an ability to run at up to 97 km/hour (60 mph), although probably only for short bursts (Blanco & Jones 2005): these speeds may seem incredible, but today's fastest cursorial bird, the ostrich, can attain similar speeds (see Folch 1992). One particular surprise has come with the discovery of the North American giant, *Titanis walleri*, in that it shows major modifications to the wing. Instead of the reduced wing one would expect in a flightless bird, its forelimbs were surprisingly well developed and equipped with manipulative thumb-claws, providing the adult bird with a two-clawed 'hand', possibly utilised in manipulating prey. Whether other members of the family possessed this adaptation or not is still unknown (Chandler 1994). Thus, *T. walleri* is the only species of bird known to date in which the adult possessed such a two-clawed 'hand', even though a few other, modern groups, namely the Hoatzin (*Opisthocomus hoazin*) and certain turacos, have wing-claws when young.



The family Phorusrhacidae was a widespread group, with representatives throughout Central and South America and with at least one species (*Titanis walleri*) reaching into the southern USA. The most obvious characteristic of the family is the deep, raptorial bill, giving the birds a large-headed appearance quite unlike that of any large flightless bird today, as seen in this reconstruction of *Paraphysornis brasiliensis*.



A further three groups of 'runners' were related to the cranes and rails (Gruides). These were families whose members occupied the grasslands of the Northern Hemisphere from the Eocene to the Early Pliocene: the Geranoididae, a North American radiation in the Eocene and a family that we know little about; the Eogruidae, their contemporaneous Palearctic equivalents, of which one species at least, the Late Oligocene *Sonogrus gregalis* from Outer Mongolia, showed sexual dimorphism in size; and the Ergilornithidae, highly specialised forms from the Oligocene to Pliocene of the Central Asia steppes. These crane-sized birds were highly cursorial, so much so that they were probably flightless or nearly so (Olson 1985). More amazingly, ergilornithids show an evolutionary trend in the reduction of toes, to the extent that species such as the Late Miocene/Early Pliocene *Amphipelargus maraghanus* had just two toes on each foot, a feature shared only with the modern ostrich (Harrison 1981). This remarkable example of co-evolution is an adaptation for running at speed on open terrain, and such a reduction in toes is also shown by plains mammals, most notably the horses (Equidae). In life, these birds must have been amazing to watch, while the habitat that they occupied would have been all the more extraordinary, given that they shared their steppe home with an ostrich.

The origins of the Gruides as a whole are in the Eocene, if not the Paleocene. The cranes are represented in the fossil record by at least 20 species. However, many of these have been described only from fragmentary tibiotarsi, which makes their reconstruction difficult, to say the least. Indeed, the fossil record of the Gruidae is so poor for the early part of their history that doubt has been cast even over some of those bones that are accepted currently as gruid (Mayr 2005a). The oldest recognised cranes include *Geranopsis hastingsiae* from the Upper Eocene of southern England. Even this may turn out to belong to a different group: resemblances have been shown between the coracoid of this species and those of *Anserpica kiliani*, a possible magpie-goose from the Upper Oligocene of France. Modern cranes belong to two subfamilies, the Balearicinae and the Gruinae, and it is thought that these split at a very early stage in the evolution of the family. Today, the Balearicinae are restricted to two African species of Crowned Crane. However, the subfamily was at one time more widespread and more diverse. *Balearica exigua*, smaller than the modern species, was present in North America during the Miocene, alongside the member of another genus, *Probalearica crataegensis*. A member of this second genus, *Probalearica mongolica*, occurred during the Upper Miocene in Europe and the Pliocene of Asia. *Probalearica*, or at least *P. crataegensis*, was described by Olson (1985) as being similar to *Balearica* and he suggested that it may be part of that genus. Of these 'crowned' cranes, *B. exigua* is perhaps the best preserved, with several almost complete fossils uncovered from the ancient damp grassland beds of Nebraska, showing that the habitat for this species was similar to that of the African species (Feduccia & Voorhies 1992). Although the habitat may have been similar, no inferences can be made with regards to the plumage of these ancient balearicine cranes. Whether they bore the tufted crests of today's species or not is unknown; it is more likely that this is a feature of the modern *Balearica* species through the isolation of their ancestor in the Afrotropics. Like these balearicines, the fossil Gruinae show many skeletal similarities with their extant relatives, although the Upper Miocene *Camusia quintanai* from the Mediterranean island of Menorca shares a number of plesiomorphic traits with the Balearicines, despite being placed in the Gruinae (Seguí 2002). Endemic island species have been found elsewhere, with the Pleistocene species *Grus melitensis* from the islands of Sicily and Malta and the Caribbean *Grus cubensis*, another Pleistocene species, but one distinguished by its flightlessness. The origins of the Gruidae remained a mystery until 2005, when Gerald Mayr published a paper describing what he called a 'crane precursor', *Parvigrus pohli* (Parvigruidae), from the Lower Oligocene of Lubéron in southern France, a time when southern Europe was a place of tropical forests (Mayr 2004c). To date, this is 'the most substantial Paleogene fossil record of the Grues' (i.e. limpkins and cranes), 'and [is] among its oldest representatives'. Unlike modern cranes or limpkins, this chicken-sized fossil had a short beak and rail-like limb proportions. *Parvigrus* possesses many features shared with either the cranes or the limpkin and was what can best be described as a mosaic of the two groups. The paper also hints at the evolution of the cranes and limpkins, suggesting that the former evolved into the giant long-legged form that we know today as an adaptation to life on the grasslands and damp marshlands that appeared and spread towards the end of the Oligocene and throughout the Miocene (Blondel & Mourer-Chauviré 1998), while the limpkins evolved in response to a specialised niche, as an adaptation to eating snails in marshland conditions. Within the Gruidae, *Parvigrus* shares most features with the Balearicinae, adding further credence to the perception that this latter subfamily is the more primitive of the two living groups.

The last two groups to discuss are the Otidides and Ralloidea, and these are vastly different in the number of fossil and subfossil representatives they possess. The few

representatives of the bustards are Palearctic in distribution. The greatest number is listed for the Pliocene, for example *Otis paratetrax* from Moldavia and the tentative bustard *Gryzaja odessana*, from the Ukraine, while at least one species is listed for the Miocene of Europe. The Ralloidea may incorporate the Messelornithidae (already described), as well as the Heliornithidae (finfoots) and the Rallidae (rails) (Houde *et al.* 1997, Livezey 1998, Mayr 2005a). Heliornithidae is known only from single fossils of members of extant genera from the Miocene of the USA and the Middle Miocene of Chad. The latter is a species closely related to the Asiatic Masked Sungrebe (*Heliopais personata*), indicating a more widespread distribution for that genus in the past (Louchart, Mourer-Chauviré *et al.* 2005). Rallidae has a more substantial fossil record, although many species are known only from a few bones, so little can be diagnosed as to their living form. The earliest species are known from the Eocene, and include members of the genus *Quercyrallus* from France (Cracraft 1973) and a variety of American species, such as *Eocrex primus*, a relative of the gallinules from Colorado, and *Palaeorallus troxelli* from Wyoming (Wetmore 1931). More substantial records are known for later, European, genera, with, for example, *Rupelrallus* and *Belgirallus* from the Lower Oligocene (see Mayr 2005a, 2006b). The major groups such as the coots, gallinules and marsh-rails had evolved by the start of the Pliocene (Feduccia 1968, Wetmore 1957). A substantial number of these rails were flightless or nearly flightless, especially subfossil species from island habitats. Like so many island species, these Holocene rails fell to the advance of humans and their exotic familiars. Most notable among these were the giant coots of New Zealand and the Chatham Islands (*Fulica prisca* and *F. chathamensis*, respectively), and the Takahes, including the subfossil North Island form, *Porphyrio m. mantelli*, which Trewick lists as a species separate from the surviving South Island form *hochstetteri* (Trewick 1996, 1997). Europe also possessed at least one flightless island endemic whose extinction may be related to the colonisation of its island by early humans during the Pleistocene or early Holocene, namely the Ibizan *Rallus eivissensis*, closely related to *R. aquaticus* (McMinn *et al.* 2005). Other flightless rails have been described from the Americas with members of the genus *Rallus* in Bermuda (Olson & Wingate 2000, 2001) and members of the genus *Nesotrochis* from the Caribbean (see Livezey 1998).

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Turniciformes  
2 fossil species, 2 genera

Before we leave the gruiforms and their relatives, we should perhaps mention the enigmatic buttonquails (Turnicidae), with their mosaic of characteristics. There is not much to tell fossil-wise, as no turnicid fossils have been found apart from Neogene examples of modern species. In 2000, Mayr described a stem group, the Turnipacidae, from Lower Oligocene deposits at Céreste, France. Two species were listed, *Turnipax dissipata* and ('tentatively') *Cerestenia pulchrapenna*. Evidence indicates that these two families may be an early offshoot of the Charadriiformes, rather than derived from Gruiformes or other ancestors.

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Charadriiformes  
99–102 fossil species, 61 genera

One theory on the evolution of the neornithines pivots around the existence of a group of birds with a mosaic of characteristics—the so-called 'transitional shorebirds' (Feduccia 1996)—and their subsequent diversification at the start of the Tertiary (Feduccia 2003a). This has drawn major disagreement from many phylogeneticists, particularly because of its reliance on 'a limited fossil record of neornithine birds from the Cretaceous and Paleocene, classified to within just a handful of the modern orders' (Dyke & van Tuinen 2004). Recent work combining the fossil and molecular records suggests that this may be a real phenomenon rather than an artefact of the fossil record (Ericsson *et al.* 2006). One such group that Feduccia included in the transitional shorebirds is the form-family Graculavidae, a globally widespread assemblage that show certain similarities to the modern Burhinidae. However, many examples are fragmentary, while the family has not yet been examined cladistically, which would reveal the relationships within the group and would provide evidence as to whether the Graculavidae should be included in the Charadriiformes in the first place. Whilst other charadriiform fossils have been described for the Paleogene, Mayr (2005a) states that, in Europe at least, modern-type Charadriiformes are not known before the Oligocene. When they do appear on the scene, the majority of these waders closely resemble modern forms, to the point that several belong to modern genera.

For the more unusual diversifications within the order, one has only to examine the Alcidae, a group of pelagic species adapted to underwater pursuit diving, often at the expense of their flying capabilities. The auks, possibly because of their more robust skeletons, have a much stronger fossil record than most other charadriiform families, and have definitive examples as far back as the Middle Miocene. Even at this time alcids were present in both the Pacific and Atlantic oceans. Earlier fossils attributed to the group, namely *Hydrotherikornis* and *Petralca*, are considered by some authors to be of doubtful affinities, with *Hydrotherikornis* closer to the Procellariiformes and *Petralca* being too poorly described to justify inclusion in the Alcidae (see Warheit 2002). Another fossil with alcid affinities, as yet undescribed, has been found in the



Lower Eocene deposits of England and, if this does indeed turn out to be an alcid, would be the earliest member of that group so far found. The major radiation of the auks occurred in the Late Miocene, with the appearance of several genera, modern and fossil. Most of these were Pacific species, including several from the upwellings off the coast of California. Like other seabird groups, flightlessness has occurred in more than one lineage within the family. Many are familiar with the Great Auks (*Pinguinus* spp.) of the north Atlantic, in particular the last species of the group, which was forced into extinction within the last 200 years (see Fuller 2002). However, there is a much older group, from the Late Miocene to Late Pliocene of the Pacific, so distinct that they form a separate subfamily, Mancallinae; indeed, Miller (1946) considered them a separate family, Mancallidae. These auks included *Mancalla californiensis*, a species from California about the size of the Great Auk that showed a more advanced state of evolution towards the penguin-like anatomy of underwater 'fliers' than was evident in the Atlantic *Pinguinus*. Warheit lists three genera in the mancalline radiation: *Mancalla*, with five named species, ranging from the Late Miocene to the Late Pliocene; *Praemancalla*, a less advanced group consisting of two, possibly three, species; and the primitive *Alcodes*, a poorly known mancalline progressing towards flightlessness that was found in the coastal region of California during the Middle to Late Miocene. It is not known why the mancallines became extinct, although a number of possibilities have been suggested, one being extinction through unsuccessful competition for breeding space and food with the Otariidae, the eared-seals, which were becoming abundant during this period (Konyukhov 2002).

Sandgrouse have also been connected with the Charadriiformes, although their fossils do not give us any clues as to whether they are more closely related to the shorebirds or to the pigeons. Indeed, few fossil species have been recorded. The earliest described comes from Upper Oligocene deposits in France. These belong to two genera, *Archaeoganga* consisting of three species, and the more modern *Leptoganga*, with the species *L. sepultus*, from the Upper Oligocene/Early Miocene (see Mourer-Chauviré 1993). Nor can we look to the Columbidae to find these connections, as their early fossil record is also scant. The earliest definitive member of the Columbidae is *Gerandia calcaria*, a small dove from the Miocene of France. Another dove, *Microena goodwini*, was described from the Lower Eocene of the London Clay deposits (Harrison & Walker 1977), but this specimen consists solely of a tibiotarsus, which makes its identification difficult (Dyke & van Tuinen 2004). Indeed, Mayr regards it as a member of the swift/nightjar radiation, rather than a dove (Mayr 2005a). The later record of the Columbidae is more substantial, with a number of subfossil species recovered from Holocene archaeological sites in the Pacific. The giant *Nutunaornis gigoura*, from the island of Viti Levu (Fiji), characterizes the extinct pigeons of the Pacific in that it was the largest of its group; similar trends can be seen with the extinct *Caloenas canacorum* and *Gallicolumba longitarsus* from New Caledonia and *Ducula davidi* from Uvea. *Nutunaornis* is known from a number of bones, including leg and wing bones and part of the beak, from which it can be estimated that the bird was 30% larger than its nearest relatives, members of the genus *Goura*: this species approached the Mauritius Dodo (*Raphus cucullatus*) in size (Worthy 2001).

The cuckoos are another enigmatic group. They have been associated most often with the turacos in modern classifications, and with the occasional inclusion of the Hoatzin, although this is not widely accepted (see Sibley & Ahlquist 1990). The most recent (morphological) analysis of the cuckoos, Hoatzin and turacos, however, placed the last two together with the cuckoos on a separate lineage, but related through a distant ancestor, *Foro*, which may have been predominantly terrestrial in form (Hughes 2000). The fossil record of the Cuculidae itself is too scanty to support or refute this. Although the oldest confirmed species are two small North American species, *Eocuculus cherpinae*, an arboreal cuckoo from the Late Eocene of Colorado (Chandler 1999), and *Neococcyx macrorquodalei*, from the Early Oligocene of Saskatchewan, there are other, Old World, contenders for the title, including *Dynamopterus* from the Eocene/Oligocene of France (Mayr 2006c). However, because this genus is represented by two humeri, one at least (that of *D. boulei*) probably being a member of the raptor genus *Aquilavis* (Olson 1985), more skeletal elements are required before their identity as cuckoos can be corroborated (Mayr 2005a). Another relative of the cuckoos, *Proculiculus minutus*, has been identified from Early Eocene deposits from the south of England, but its placement within the order is also only putative. As we see with so many groups, the difficulties of identification, either through interpretation of the fossils, the need to examine fossils using modern techniques, or even just the fragmentary nature of the fossils themselves, all lead to a confusion of phylogenetic identity. Such is the example of the Parvicutulidae, initially placed alongside the cuckoos, then moved to the catch-all zygodactyl family Primobucconidae in the 1980s, before the realisation that, in fact, they may be relatives of the caprimulgine radiation.



The Mancalline auks show a predominant evolution towards flightlessness, with the last members of the group, the four species within the Pliocene genus *Mancalla*, having flipper-like wings. These early-radiation auks showed adaptations to underwater 'flying' far more advanced than any other alcids, living or extinct, including the famous Garefowl or Great Auk (*Pinguinus impennis*).

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#### Pterocliiformes

4 fossil species, 2 genera

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#### Columbiformes

25–26 fossil species, 17–18 genera

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#### Cuculiformes and Musophagiformes

11–14 fossil species, 10–11 genera





The Eocene fossil *Foro panarium*, discovered in the Lower Eocene Green River Formation of Wyoming, shares characteristics with three groups of birds: the turacos (*Musophagidae*) of Africa; the South American Hoatzin (*Opisthocomidae*); and the more cosmopolitan cuckoos (*Cuculidae*). This mosaic of features has influenced the suggestion that the three groups are related, with *Foro* being another lineage originating from a basal cuckoo-turaco-Hoatzin ancestor.

Psittaciformes  
28 fossil species, 24 genera

What is probably more interesting—a better word may be ‘odd’—is that the majority of known cuckoo fossils are American, when the group is thought to have originated in the Old World. Indeed, according to Hughes (2000), the most primitive extant species come from South-east Asia in the form of the ground-cuckoos of the genus *Carpococcyx*. This new classification is different from that of the Peters *Check-list* used as the starting point for HBW, and the DNA–DNA hybridization classification, but the former makes assumptions as to the evolution of the zygodactyl foot and the occurrence of terrestriality in the family, while the latter had major omissions in its pair-wise comparisons: the studies of Hughes, admittedly, lack molecular work, so may also have flaws in the decisions made, even if it does make a convincing case. If we do assume that Hughes is correct, it is probably to the Old World tropics, with a focus on the east, that one would have to look in order to find early fossils relating to the group. Of the more modern, post-Oligocene, fossils, it is perhaps worth mentioning two in particular. One is the ground-cuckoo *Cursoricoccyx geraldinae* from the Lower Miocene of Colorado (Martin & Mengel 1984), which is the most northerly species of the Neomorphine cuckoos found to date, although this hints more at the climate in North America at the time rather than being a truly remarkable record. The second, *Geococcyx (californianus) concklingi*, is of a Pleistocene relative of the Greater Roadrunner (*Geococcyx californianus*), first found in the Donna County caverns of New Mexico by Hildegard Howard in 1931. This was a large species, which, if the measurements she provides are typical, was more than 10% larger than the modern form of *G. californianus*. However, its wing bones, or, rather, the dimensions of the ulna, are 24% larger, the proportions to the rest of the fossil elements inferring that this bird was perhaps less adapted to cursoriality than is the modern form, with which it was contemporaneous.

The turacos are younger than the cuckoos and are known from as far back as the Lower Oligocene, with an unnamed species listed for Bavaria (Ballmann 1970). Oligocene fragments from Egypt have also been assigned to the family, but Olson (1985) regards this evidence as unreliable. Further species are known from the Lower Miocene of Kenya (*Musophaga africanus*) and contemporaneously from France (*M. meini*). Thus, despite the fossil record for the *Musophagidae* being so meagre, we find that they had an ancient range that included Europe as well as Africa. This may be a surprise to many, until one realises that the early Paleogene was a warmer period than now, with extensive tropical forests across Europe, and elsewhere. *Promusophaga* from the Late Eocene of the USA and London Clay was also considered to be a turaco, but is in fact an example of *Lithornis vulturinus*, and is therefore a member of the palaeognathous family *Lithornithidae* (Leonard *et al.* 2005, Olson 1985).

The parrots have been associated with both the Columbiformes and Cuculiformes or with a number of other zygodactylous species, in particular the Coliiformes, but their actual origins remain unclear (Mayr 2002b). Until recently, very few fossils were available, except for modern parrots from archaeological sites, which did shed some light on the diversity of Pacific parrots prior to human colonisation: for instance, the lorries *Vini sinotoi* and *V. vidivici* from the Marquesas Islands (Steadman & Zarriello 1987), and some modern genera and species from Miocene and Pliocene sites in the Americas and Australia (see Mayr & Göhlich 2004 for a brief review). However, in recent years, parrot-like fossils have been discovered from the Eocene of Europe and North America. Some of these are reanalyses of known, but enigmatic, species, such as ‘*Primobucco*’ *olsoni*, formerly placed in the Piciformes alongside the *Galbuli* (Feduccia & Martin 1976, Houde & Olson 1988): Mayr points out that this species may be better listed as ‘*Pulchrapollia olsoni*’, owing to its possible conspecificity with *Pulchrapollia gracilis* (Mayr 2002b). Some of the new fossils may belong to the *Psittacidae*, e.g. *Xenopsitta fejfari* from the Czech Rebulic (Mlíkovský 1998). Others represent Eocene species from more primitive families. *Pseudasturidae*, for instance, is a group with representatives in Europe and the USA (Mayr 2002b; see also Dyke & Cooper 2000), for example *Pseudasturides* (formerly *Pseudastur*) *macrocephalus*, a Middle Eocene ‘parrot’ from Germany and the type species for the family (Mayr 2002b, 2004a), while others, such as *Bavaripsitta ballmanni* from the Middle Miocene of southern Germany (Mayr & Göhlich 2004), are as yet of unknown affinities. The oldest representatives of the *Psittaciformes* so far known thus occur in Europe and North America, rather than the Southern Hemisphere as one may have expected given the distribution of the majority of extant species. The most remarkable feature of the complete specimens of *pseudasturids* (‘*Primobucco olsoni*’, *Serudaptus pohli* and *Pseudasturides macrocephalus*) is the lack of a parrot-like beak. Instead, they possess something more general in form, which explains the previous confusions. Another family, the *Quercypsittidae*, are known from the Upper Eocene of France (Mourer-Chauviré 1992), but the beak of this family is not known. Given that they are regarded as another family of primitive parrot-relatives, it is not illogical to suppose that these

birds also possessed a generalist unhooked beak, rather than one resembling that of modern-day species. Other species included in the Psittaciformes at one time or another have now been assigned to other groups. Included among these is *Palaeopsittacus* from the London Clay (Harrison 1982): currently regarded as *incertae sedis*, this species shows similarities with the frogmouths (Mayr 2003b). One problematic find is that of a jaw fragment from the Cretaceous of Montana (described by Stidham in 1998). However, its identity as a bird, let alone as a parrot, has been contested by Dyke & Mayr (1998).

Owls were also thought to have fossil representatives in the Cretaceous. However, these have since been shown to belong to a group of theropod dinosaurs! Currently, the honour of 'oldest owl' belongs to the Paleocene *Ogygoptynx wetmorei*, described from a fossil tarsometatarsus found in SW Colorado (Vickers-Rich & Bohaska 1976) and *Berruornis*, a large owl originally described from the Upper Paleocene of France. Both belong to fossil families, the Ogygoptingidae being monotypic, while *Berruornis* joined several other owls in the Sophiornithidae, a European family that existed from the Upper Paleocene to the Oligocene, and included the Eocene/Oligocene *Sophiornis quercynus*. The fossil record of owls is fairly extensive compared to other land groups, with at least six families present, consisting of about 90 species. Several species come from the Paleogene of Europe and North America, including members of the family Protostrigidae, whose type genus, *Protostrix*, was synonymised with *Minerva* (Mourer-Chauviré 1983). The protostrigids are thought to be the sister-group to the tytonid and strigid lineages (Mourer-Chauviré 1987). *Minerva* spp. were large owls, about the size of *Bubo*, for which members of the genus were originally mistaken. The relationship among the different owl groups, particularly between these ancient groups and the modern families, still needs to be understood properly. What can be said is that owls were far more diverse in the early Paleogene than they are now. Recently, the supposed Eocene raptor *Messelastur* from Europe has also been connected with the owls, being similar to *Tynskya eoceana*, an 'owl' from the Green River Formation of Wyoming: together, they constitute a sister-group to the Strigiformes, rather than being ancestral to them, and, controversially, unite the clade (Messelasturidae + Strigiformes) as the sister-group to the raptors (Falconidae + Accipitridae) (Mayr 2005h). Of the modern families, Tytonidae is the older, and was more diverse during the Paleogene, with two subfamilies in existence prior to the modern subfamilies. The *Necrobyinae* consisted of *Nocturnavis incerta*, a species from the Eocene and Oligocene deposits of the Quercy Fissures in France, and *Necrobyas*, also from Quercy (Mourer-Chauviré 1987; see also Bruce 1999). The tarsometatarsus of these owls is similar to that of the modern barn-owls, but is shorter and stockier. Several other 'modern' owls have been described from Paleogene Europe, mostly from Quercy, including *Selenornis henrici*, member of a second tytonid subfamily, Selenornithinae. Modern-type tytonids are not known until much later, with the majority of species coming from the Pleistocene and Holocene. Sexual dimorphism existed in at least some of these fossil *Tyto*, for instance the Pleistocene *T. neddi* from the Caribbean island of Barbuda (Steadman & Hilgartner 1999), and *T. mourerchauvireae*, a large owl from the Middle Pleistocene of Sicily (Pavia 2004). Several of these extinct tytonids, including the Pleistocene *T. balearica* of the western Mediterranean, were giants in the family, while some were merely large versions of the typical barn-owl type. Studies on sites where groups of tytonid species existed suggest that competition between the different species caused them to evolve into different size-class niches, a phenomenon that also involved the related strigid owls. For instance, during the Pleistocene, Cuba possessed three *Tyto* owls, one being *T. alba*, one substantially larger (*T. noeli*) and the last, *T. riveroi*, being a true giant, the size of an eagle-owl. Also present in this 'series' was a truly huge, probably flightless, strigid owl, *Ornimegalonyx oteroi* (Arredondo 1976, 1982). Gigantism therefore is not restricted to the Tytonidae, and nor are they all fossils, for they include such species as the Great Grey Owl, *Strix nebulosa*. Most famous of these giants is probably the La Brea Owl, originally described as a form of the Great Horned Owl (*Bubo virginianus*) but later recognised as being a species in its own right, not related to *Bubo*, but to the Barred and Spotted Owls, with which it was compared (Howard 1933) and thus given the name of *Strix brea*: to date, it does not seem to have been compared with the even larger *S. nebulosa* (Feduccia 1996). There is one special group of 'normal-size' owls that were specialist hunters of birds. These were members of the genus *Gallistrix*, which inhabited the islands of Hawaii until fairly recently. They possessed short, rounded wings and long legs similar to those of an *Accipiter*, occupying the niche these hawks would have occupied had they been on the islands. Each of the major islands had its own species of *Gallistrix*, with *G. auceps* on Kauai, *G. erdmani* on Maui, *G. geleches* on Molokai and *G. orion* on Oahu. As with so much of the avifauna of the Hawaiian Islands, human colonisation was their downfall, despite their abundance in the fossil deposits. Today, only two owl species exist

#### Strigiformes

84 fossil species, 29–30 genera



*Ornimegalonyx oteroi* was a huge, possibly flightless, strigid owl from the Late Pleistocene of Cuba, its measurements suggesting a bird about twice the size of the modern Eurasian Eagle-owl (*Bubo bubo*). Among its most notable features are its long heavy toes armed 'with the most powerful claws possessed by any strigiform bird' (Arredondo 1976). Given the virtual absence of mammalian predators on the island (with the exception of a fossil dog), this owl must have been one of the top predators, and the scourge of the larger herbivorous mammals.



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Caprimulgiformes and relatives  
23 fossil species, 19 genera

on the islands, the Hawaiian endemic subspecies of the Short-eared Owl (*Asio flammeus*), thought to be a recent colonist (see, e.g., Burney *et al.* 2001 and Olson & James 1982), and the introduced Common Barn-owl (*Tyto alba*).

The superficially owl-like Caprimulgiformes are also an ancient lineage, with the oldest current examples originating from the Eocene. The Paleogene saw the existence of species belonging to modern families as well as others that have no modern equivalents. Included among these are the enigmatic Fluvioviridavidae, consisting of two species from the Eocene of North America and Europe (Mayr 2005i, Mayr & Daniels 2001), although these have still not been placed definitively in a known order. An extinct group of definite nightjar-relatives, the Archaeotrogonidae, were found in European deposits. Assigned to the trogons from the initial description of *Archaeotrogon* in 1892, similarities with the Caprimulgiformes were noted in 1980, when Cécile Mourer-Chauviré described the family as *incertae sedis*. It was not until 1995 that she moved the family into the Caprimulgiformes. Archaeotrogonidae consists of five small species. Four belong to the genus *Archaeotrogon* of the Quercy fissures, with *A. venustus* having the greatest temporal range, from the Late Eocene to the Late Oligocene, the other three being restricted to the Oligocene (Mourer-Chauviré 1995b). The fifth species is *Hassiavis laticauda*, a putative *Archaeotrogon* from the Middle Eocene of Messel, and, at about 13 cm in length, the smallest as well as the oldest species in the group. This last species already showed adaptations to catching insects on the wing. In particular, it had a short, wide beak, most similar to that of the owlet-nightjars, although this may be the expression of plesiomorphic characteristics, rather than any sign of direct relationships (Mayr 2004c). Additionally, *Hassiavis* is preserved with its feathers, and those of the tail are distinctly barred, as in the majority of modern Caprimulgiformes. Paleogene Europe hosted species of at least two other extant families, both now restricted to the tropics. Three species of potoo (Nyctibiidae) have been recorded from Europe, with *Euronyctibius kurochkini*, identified from an incomplete humerus from the Upper Eocene/Oligocene deposits of France (Mourer-Chauviré 1989b), and members of the genus *Paraprefica* from the Middle Eocene of Germany (Mayr 1999b, 2005m). The latter have a mosaic of characters, with the derived skull and tarsometatarsus of modern species, but otherwise showing a more primitive structure, and thus indicating their status as stem-lineage representatives. The only other nyctibiid fossils are of a modern species, within the current, South American range of the family. A similar tale can be told for the frogmouths (Podargidae), with two age groups of fossils, one from Quaternary deposits of Australia, the other from the early Paleogene of Europe. The European frogmouths consist of two species, with an additional species regarded as 'putative'. The first of these three to be discovered was originally considered to be a parrot. However, *Palaeopsittacus georgei*, as it is known, may be a stem-lineage representative of the Podargidae and is very similar to the French *Quercypodargus olsoni*, which is a primitive frogmouth. Paleogene fossils pertaining to the oilbirds and owlet-nightjars have also been putatively identified from isolated bones from Europe. However, further specimens are required to confirm their presence. The only confirmed oilbird fossils (*Prefica nivea*) come from the Lower Eocene of the Green River Formation of Wyoming.

The earliest confirmed representative of the Aegothelidae is a small, partially associated specimen from north-west Queensland. However, it is during the Quaternary that we find some surprises pertaining to this family, including a species from the Pleistocene of New Zealand, *Aegotheles novaezeelandiae*, a more terrestrial species than those that remain today, although it is similar to, but longer legged than, the New Caledonian Owlet-nightjar (*A. savesi*), an endangered, species also known from a few Pleistocene fossils. As with many of New Zealand's birds, *A. novaezeelandiae* became extinct with the advent of Polynesian colonisation, although its actual demise seems to have been due to the introduction of the Pacific rat (*Rattus exulans*), which initiated its decline 1000 years prior to widespread Polynesian settlement (Holdaway *et al.* 2002). The most widespread and speciose of the families today is the Caprimulgidae. However, this family has a very poor fossil record, and little can be said as to the evolution or even prehistorical extinctions within the group.

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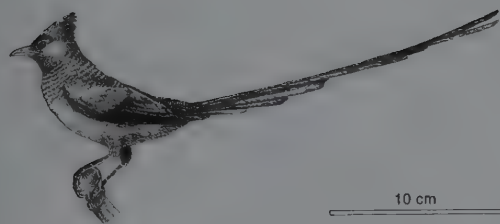
Apodiformes  
22–24 fossil species, 14–16 genera

The origins of the Caprimulgiformes have recently been discovered to be closely tied to the evolution of another aerial group, the Apodiformes. The major twist in the story came when Mayr (2002a) discovered that the owlet-nightjars may be more closely related to the Apodiformes than they are to the other caprimulgiform families. The discovery began with the analysis of an Eocene family of basal swifts, Aegialornithidae, which bore striking resemblances to recent Caprimulgidae and Aegothelidae, as well as resembling another contemporaneous 'caprimulgiform' family, Archaeotrogonidae. The close relationship of the whole clade, Cypselomorphae, has been further bolstered by the discovery of the aerial-hawking *Protocypselomorphus manfredkelleri* from the Messel; it appears to sit phylogenetically outside this clade as its sister-taxon



(Mayr 2005j). The phylogenetic position of Archaeotrogonidae, however, remains uncertain. Both the Aegialornithidae and Archaeotrogonidae were amongst the most abundant small birds in the Upper Eocene of Europe. Temporally, they existed from the Middle Eocene to the Lower Oligocene, with fossils found in Germany and France (Mayr 2003a, Mourer-Chauviré 1980, Peters 1998); indeed, their temporal range may even have extended as far back as the Early Eocene, as recent finds in North America suggest (Olson 1999). The early swifts, such as *Aegialornis gallicus* of the Quercy fissures, were similar to modern tree-swifts in general form (Mayr 2003a). At least two other groups of swifts overlap with these birds. One, *Eocypselus vincenti*, is a tiny species known from an incomplete specimen from the Lower Eocene London Clay. It is one of the most primitive swifts, and is placed in its own family, the Eocypselidae, although it has also been placed alongside the Hemiprocnidae (Mourer-Chauviré 1988): like the aegialornithids, this latter resemblance may be more due to superficial, plesiomorphic similarities than to any true relationship. The Apodidae have records in the Early Eocene of Denmark and the Middle Eocene of Germany, in the form of *Scaniocypselus wardi* and *S. szarskii* respectively. Like modern species, these birds (or, *S. szarskii*, at least) had long wings and a short tail that was hardly forked. Given their structure, they probably hunted much in the way of modern species. However, the most remarkable discovery has to be that hummingbirds and at least some of their ancestors existed in Europe in the Paleogene, if not elsewhere in the Old World. Primitive hummingbirds were first described in the late 1980s from a tiny bird discovered in Lower Oligocene deposits in the Caucasus. This was named *Jungornis tessellatus*, and allotted a new family, Jungornithidae (Karhu 1988); another specimen of *Jungornis* was recently discovered dating to the Late Eocene of France, extending both the temporal and geographical ranges of the genus (Mourer-Chauviré & Sigé 2006). Since then, other species have been described, for instance *Argornis caucasicus*, from the Upper Eocene, a less specialised bird than *Jungornis*, and *Parargornis messelensis* from Germany. These were initially placed in the Jungornithidae, but doubt has been cast over this: they may represent separate lineages on the evolutionary line towards modern-type hummingbirds. Other than *Parargornis*, these stem-hummingbirds are known only from wing bones of single specimens. The *Parargornis* fossil is particularly striking, as it is a fully feathered specimen (Mayr 2003), and thus can be used to gain a lot more information about these tiny 'micro-swifts'. *Parargornis* had a swift-like bill, but a long tail like that seen in some modern hummingbirds. However, its wings were broad and rounded, unlike any other apodiform known. At a length of 13 cm (with the long tail feathers), this bird was tiny, like others in the group. What is apparent from the wing and tail is that the bird was not adapted to gliding, although it may have captured insects on the wing. The suggestion is that *Parargornis* fed in dense vegetation and may have adopted a flycatcher-like hunting strategy, with the tail enabling great manoeuvrability. None of these, though, are true hummingbirds. The modern, trochilid, nectar-feeding hummingbirds probably diversified in the Neotropics in the Late Miocene (as per Bleiweiss 1998a, 1998b), but their origins are thought to extend back to the Paleocene (Bleiweiss 1998c). However, in 2004 a totally unexpected find was described from the Early Oligocene of Germany (Mayr 2004d), when a 'basal hummingbird' was described and given the rather appropriate name of *Eurotrochilus inexpectatus*. Other than a few bones from the late Quaternary, this is the only other fossil that can be attributed to the family. About the size of a Rufous-breasted Hermit (*Glaucis hirsutus*), *Eurotrochilus* resembled modern hummingbirds in several ways, not only in size, but in bill type and wing form, together inferring nectarivory over other forms of foraging, although it must be stressed that there is no direct evidence to 'confirm' this observation (Mayr 2007). What this fossil does do is provide an Old World origin for the Trochilidae, contrary to what their current distribution would suggest, and it brings into focus the possibility that some Old World flowers of ancient lineage may have evolutionary traits related to a co-evolution with hummingbirds, for example the ericaceous *Agapetes* from the Himalaya (see Mayr 2004d).

Evidence from Europe and North America suggests that during the early Tertiary the passerines were largely absent. Consequently, the niches that they would subsequently take over were open to occupancy by other, non-passerine, groups for at least 30–40 million years before their arrival and domination. One group, that including *Parargornis*, had moved into a niche now occupied by flycatchers and some warblers: *Parargornis* may even have foliage-gleaned, much as the prediction for the original proto-hummingbird has been described, hovering below and around the leaves, picking off the insects it found. A myriad of zygodactyl forms and other so-called 'near-passerines' occupied other 'passerine' niches. This diversity of small birds can be exemplified best through exploration of the mousebirds (Coliiformes), which today contains a single family (Coliidae) of only six species, all confined to the continent of



The enigmatic mousebirds of the family Coliidae represent a relictual lineage of a group of arboreal birds. In the early Tertiary, their diversity in form was much greater, with icterid-like members and birds with a more generalist bill, as seen in this *Sandcoleus copiosus*. Like modern colies, it was capable of a zygodactylous grip, as well as pointing all toes forward, an adaptation that would help it get purchase on twigs and branches as it clambered about in the canopy.

Africa. However, the fossil record lists 15 species, in two main families, from the Eocene of Europe and North America. The second family is the Sandcoleidae, originally described from the Paleocene and Lower Eocene of North America (Houde & Olson 1992), when the several species, including the Lower Eocene *Sandcoleus copiosus*, were given a family, and order, of their own. One of their number, *Eobucco*, was a ubiquitous genus in North America, with *E. brodkorbi* from the Middle Eocene (Feduccia & Martin 1976) and at least two other species from Wyoming (Houde & Olson 1988). These birds bore many mousebird-like features, from the long, tapered tail without strengthened shafts to a large pygostyle (a unique feature of the Coliiformes). Like *Sandcoleus*, *Eobucco* had a slightly curved beak, larger than that of modern colies, giving both genera a superficial resemblance to some cuckoos. Sandcoleids, like the Coliidae (see de Juana 2001), were notable for their foot structure, as it is thought that they could rotate their toes either into a pamprodactyl position (like many swifts, probably as an aid to clinging onto vertical surfaces) or have their toes in a zygodactyl, 'yoke-toed', position. In general, the sandcoleids were generalists feeding on seeds, fruits and similar items. Of particular interest is *Chascacocolius*, described as a sandcoleid, but with some osteological differences to the type genus, and possessing two known species, one, *C. oscitans*, from the Lower Eocene of Wyoming (Houde & Olson 1992), the other, *C. cacicrostris*, a larger bird recently described from the Middle Eocene of Messel, Germany (Mayr 2005f). Only the latter is represented by a complete, articulated, skeleton: it reveals that at least *C. cacicrostris* possessed a pointed, conical bill most similar in form to modern icterids such as the caciques (*Cacicus* spp.). It may be that the species fed in the same way, plunging its bill into fruit and then opening it slightly (a method known as 'gaping'), thereby breaking it open. Several other coly-like birds are known from Eocene and Oligocene Europe. *Selmes absurdipes* has been described from a number of specimens from Middle Eocene deposits of Messel, including two articulated skeletons as well as numerous isolated bones (Mayr & Mourer-Chauviré 2004a). This species has a generalised beak, as in the Sandcoleidae, and a more elongate foot than modern colies, although it is thought to possess the same grasping ability. Originally, it was described as a sandcoleid (as per Peters 1999), but Mayr and Mourer-Chauviré have since indicated that this is a primitive mousebird closely related to the Coliidae. *Oligocolius brevitarisus*, is also closely related to modern mousebirds. This species, from the Lower Oligocene of Germany (Mayr 2000b) has more strongly developed wings than modern mousebirds and a shorter tarsometatarsus: together, these suggest a bird adapted for a more arboreal lifestyle, with adaptations towards more sustained flight than modern species. Other coliids recorded include *Masillacolius brevidactylus*, a pamprodactyl species from the Messel, two species in the genus *Primocolius* (*P. minor* and the larger *P. sigei*) from the Quercy deposits of France, while the only fossil representatives of modern genera are found in Africa, coming from the Early Pliocene (Vickers-Rich & Haarhoff 1985).

Trogoniformes  
4 fossil species, 3–4 genera

The trogons are another group where there are several examples in the fossil record, but their origins are not clarified by their early Tertiary representatives, even though these are close to the origination time of the group. Nor do they clarify their relationships with the Coraciiformes (within which they are sometimes placed), nor with the Coliiformes nor the Steatornithidae, with both of which they have recently been linked. Also, contrary to what one would expect given the modern distribution of the family, the oldest fossils known are European. The oldest articulated specimen was from the Middle Eocene of Messel, Germany (Mayr 2005e), and was tentatively placed in *Primotrogon*. This species, *P. pumilio*, resembled modern trogons in its overall morphology and in possessing a heterodactyl foot, in which the second toe is permanently turned backwards: this unique foot structure is found only in trogons. This species is very similar to *Primotrogon wintersteini*, from the Middle Oligocene of France. However, the two species differ in size, with *P. pumilio* being about 10 cm long, and therefore the smallest member of the Trogoniformes, and *P. wintersteini* being roughly 120% larger. They are separated not only by a considerable period of time (some 16 million years), but also by habitat, the former occurring in tropical forest, the latter living in arid woodland or scrub: further studies may reveal that they belong to separate genera. The skulls of these early trogons differ significantly from their modern counterparts: in particular, that of *P. wintersteini* is narrower, with a narrower beak and smaller eye-sockets, suggesting that the bird was less adapted to foraging on flying insects than modern species (Mayr 1999). *P. wintersteini* is generally similar to the Asian trogons, which are also less reliant on insects, and which take a substantial amount of fruit in their diet, unlike the more specialised African species (Collar 2001). A much larger species, *Septentrogon madseni*, has been found recently in the deposits of the Fur Formation of Denmark, dated as latest Paleocene to earliest Eocene (Kristoffersen 2002), but this bird consists only of part of the skull, enough of which



exists to ascertain that the species was also different from modern forms. There are a number of later examples of trogons, but these are very similar to modern species. Trogons do not occur in the Americas until the Pleistocene, which is in agreement with the suggestion that the Neotropical species are the most derived of the group.

The Coraciiformes *sensu lato* are regarded by many as a polyphyletic group. For instance, HBW divides the Coraciiformes into the Trogoniformes and Coraciiformes, while Sibley, Ahlquist and Monroe went further, splitting from the latter the Bucerotiformes, Upupiformes and Alcediniformes (Sibley & Ahquist 1990, Sibley & Monroe 1990). Mayr has suggested that the Cuckoo-roller (Leptosomidae) should also be removed from the Coraciiformes (Mayr 2002c). It is argued that the roller-like appearance of the Leptosomidae is more to do with the expression of a 'generalist, primitive-percher' morphology than being an indication of true close relationships within the order. The current distribution of the Leptosomidae, the island of Madagascar, is relictual, as its ancient distribution stretched at least as far north as Europe. Including these fossils, Leptosomidae consists of two genera, the extant Malagasy *Leptosomus*, and the European *Plesiocathartes*, the first species of which, *P. europaeus*, was originally described in 1908 as a cathartid vulture from an incomplete tarsometatarsus from Middle Eocene to Oligocene deposits of France (Mayr 2002c). It is only recently that other specimens of the genus have been discovered, *P. kelleri* from the Middle Eocene of Messel and *P. gaillardii* from the Early Miocene of Spain, plus isolated bones from elsewhere in Europe. The most basal group within the Coraciiformes, however, is the Primobucconidae. This is an enigmatic family whose scientific history is fairly complex. Its establishment in the mid-1970s saw the inclusion of many small arboreal species from the Eocene of North America, most of which (with the exclusion of *Primobucco mcgrewi*) have since been removed to families as diverse as Sandcoleidae and Pseudasturidae. The primobucconids were considered by the original authors to be related to the puffbirds (Feduccia & Martin 1976), but they were moved to the Coraciiformes in 1988, being placed close to the ground-rollers (Houde & Olson 1988). Currently, studies indicate that the primobucconids were a primitive family of tiny rollers (Mayr & Mourer-Chauviré 2004b). The most recent discoveries, two specimens of the Middle Eocene species *P. frugilegus* from Germany, show that at least this species was a seed-eater, all the more remarkable considering that modern rollers are all carnivorous. However, there are indications that the primitive trait within Mayr's Coraciiformes and 'Alcediniformes' is of a generalist feeder, rather than a carnivore: primitive members of the kingfisher radiation, the motmots, incorporate vegetable material (in this case fruit) in their diet, while the other basal roller family, Eocoraciidae (the Messel *Eocoracias brachyptera*), was a seed-eater. One more family of rollers existed, again in Europe: these were the Geranopteridae, whose members extend from the Late Eocene to the Early Miocene. Like the Eocoraciidae, these birds bore a mosaic of roller and ground-roller characteristics, although, in this case, there are more similarities to the latter (Mayr & Mourer-Chauviré 2000).

The fossil record of the alcedinidine and meropine groups in comparison is poor. The earliest fossil that can be attributed to them is *Quasisyndactylus longibrachis*, a tiny Middle Eocene tody-like bird from the Messel (Mayr 2004c). This fossil bears a mosaic of characters, some of which are shared with the kingfishers and their kin, others shared with the related Coracii. Its tody-like bill, however, is probably due to convergence with the todies rather than to any direct relationship, as a similar bill type has evolved independently among the motmots. Fossils of 'true' todies (Todidae) are present in the early Tertiary, but not from the current range of the family. Rather, they come from: North America, in the form of *Palaeotodus emryi*, from the Lower Oligocene of Wyoming; and from France, with *P. escampsiensis* from the Upper Eocene, and *P. itardiensis* from the Oligocene, the identity of this latter group requiring further study. These birds were larger than modern species, with *P. emryi* having proportionately longer wings, suggesting a greater power of flight than in *Todus* (Feduccia 1996). The Lower Oligocene *Protornis glarniensis* from Switzerland was another member of what is today regarded as a purely Neotropical group. Formerly considered a motmot, this species is now interpreted as belonging to a more primitive lineage, related to both the todies and the motmots (Cracraft 1980, Mayr 2005a). True motmots are known only from the Americas, with a Miocene record of a humerus that is indistinguishable from three of the six currently recognised genera, while fossils of modern species have been discovered from prehistoric sites in the Neotropics (Becker 1986b). Of the other groups, the true kingfishers (Alcedinidae) possess a number of ancient examples. For example, the oldest halcyonine, which might even be a member of the modern genus *Todiramphus*, was discovered recently in the Miocene Riversleigh deposits of north-west Queensland (Boles 1997).

The final coraciiform families to consider are the hornbills and hoopoes. The fossil record of the former consists of two ground-hornbill species, *Bucorvus brailloni*,

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#### Coraciiformes

27 fossil species, 17 genera



Today, we are aware of only two morphological types of hoopoe: those that spend much of their foraging time on the ground (*Upupidae*); and those that forage on tree trunks and branches within the canopy of trees (*Phoeniculidae*). One further group, those that foraged among the foliage in a similar manner to leaf-warblers (*Phylloscopus*), has completely disappeared. *Messelirrisor parvus* is one example of this 'hidden' radiation. Messelirrisorids were an abundant group in the Eocene of Europe, with several forms being described from Messel, the type locality.

Piciformes  
16–17 fossil species, 14–15 genera

Other zygodactyl forms  
8 fossil species, 4 genera

from Middle Miocene deposits in the Atlas Mountains of Morocco (Brunet 1971, Olson 1985), and the European *Euroceros bulgaricus* from the Late Miocene (Boev & Kovachev 2007), both of which appear to be primitive relatives to the modern species. Other fossils have been attributed to the hornbills, including *Geiseloceros*, formerly regarded as the earliest member of the group. However, it had a very short wing, unlike all modern species, and is thought now to be a member of the Idiornithidae (Mayr 2002e). One coraciiform was originally considered a member of the hornbills, namely *Cryptornis antiquus*, from the Upper Eocene of France, but it is regarded by Mayr and Mourer-Chauviré (2000) as a possible member of the roller-family Geranopteridae, and is possibly conspecific with *Geranopterus alatus*, also from Eocene Europe. However, *Cryptornis* is too poorly preserved to make a proper analysis and its correct placement awaits a better preserved specimen. This leaves us with little to go on as to the appearance of the early hornbills. However, the same cannot be said for the hoopoes, where there is at least one new family (Messelirrisoridae) from the Middle Eocene of Europe, the latter being regarded as the earliest known representatives of the hoopoe/wood-hoopoe lineage. Messelirrisorids were tiny hoopoe-like birds with curved bills, and may have had a similar diet to the modern forms (Mayr 2000c). The family includes three species, *Messelirrisor parvus*, *M. halcyrostris*, and the largest species, *M. grandis*. The Messelirrisoridae occupied a niche not utilised by either hoopoe families today, being adapted for foraging in branches of trees, unlike upupid hoopoes, but were not adapted to tree-climbing, therefore unlike the woodhoopoes. They were an abundant group during the Eocene, with several specimens found in the lacustrine deposits of the Messel, plus isolated bones from sites in Britain and France. However, there is a huge gap between these early fossils and the only upupid fossil species known (the flightless Pleistocene/Holocene *Upupa antaios* of St Helena: Olson 1975), while Miocene species have been described for the Phoeniculidae, including a tiny specimen described from the Lower Miocene of Bavaria, which may be another messelirrisorid.

The earliest members of the Piciformes *sensu stricto* also appear to be European, with the earliest record being a fragmentary tarsometatarsus from the Lower Oligocene of Belgium, the next record being of a slender tarsometatarsus from a tiny modern-type piciform from the Upper Oligocene of Germany that was not as well adapted for climbing as modern species (Mayr 2001b). Unfortunately, it is too fragmentary to be given a name, or even allocation to family within the order. The Miopiconidae, tiny birds so far only found in Miocene deposits of Morocco, are the nearest relatives to this group. The oldest articulated fossil of a barbet is that of the recently described *Rupelramphastoides knopfi*, a tiny bird from the Lower Oligocene of Germany whose overall resemblance to toucans is likely to be another example of convergence on a similar niche (Mayr 2005g). Despite its appearance, this species is regarded as a primitive omnivore or generalized insectivore within the Piciformes (Mayr 2006d). Another genus, *Capitonides*, is a member of the Capitonidae, overall being similar to the modern genus *Trachyphonus*. However, unlike the latter, which are exclusively African, *Capitonides europaeus* and *C. protractus* both come from the Miocene of Europe. Woodpeckers are comparatively late in the fossil record, being known primarily from Pliocene and Pleistocene deposits. For instance, *Pliopicus brodkorbi* was a small, slender, Melanerpine woodpecker from the Lower Pliocene of Kansas (Feduccia & Wilson 1967), contemporaneous with another, larger, species, *Palaeonerpes shorti* from Nebraska. The latter was a species similar to Melanerpines in form, but may have been part of an earlier lineage of woodpeckers, now extinct (Cracraft & Morony 1969). Pleistocene species include among their number such forms as *Dendrocopos submajor*, the ancestral species to the modern *D. major*.

There are a number of other small arboreal fossils whose relationships were unclear until recently. Most of these were discovered in Europe or North America in the past decade. The majority of this motly collection of birds originate from the Paleocene to Eocene epochs, although one family, the Zygodactylidae, occurred in the Lower Miocene. Some families, for example Primoscenidae, were among the most abundant of small birds during the early Tertiary. Of all these odd little birds, perhaps special mention should be made of *Gracilitarsus mirabilis* (Gracilitarsidae). This species possessed a body plan very different from any living bird (Mayr 2001a). Although it had a long metatarsus like all these little birds, its toes were unusually short. Its claws, however, were rather deep in cross-section, indicating a possible adaptation for hanging onto vertical surfaces. *Gracilitarsus* also possessed a 'swallow-like wing length', suggesting rapid flight capabilities, although no interpretation can be made of the full wing length since the remiges are poorly preserved; the tail feathers are lacking. *G. mirabilis* possessed a bill very similar in shape to that of *Anthreptes* sunbirds, yet it may also have been rhynchokinetic—that is, possessing a flexible tip that can be flexed upwards by muscles present in the bill, as seen today in snipe, pigeons and humming-



birds; generally, this type of bill suggests a nectarivorous bird. As its discovery predates *Eurotrochilus*, this bird holds the prize for being the first described probable nectarivore from the early Tertiary. Like *Eurotrochilus*, its phylogenetic relationships show a connection with birds present only in South America. Now *Gracilitarsus* has been shown to be a primitive piciform-relative (Mayr 2005k). The Zygodactylidae and Primoscenidae are more enigmatic, and while Mayr states that they are 'unquestionably closely related' the most recent cladogram presented (Mayr 2004b) shows two possible alternatives, one in which the two families are split, with the Primoscenidae being basal to the Piciformes + Galbuliformes, the other in which the two cluster together and are positioned as the closest relatives of the Passeriformes. Further specimens are required to resolve this fossil quandary.

The fossil record of the Passeriformes is particularly sparse when compared to the other major orders. In recent years, a number of passerine specimens have been identified, although, to date, it is only the more recent forms that have been complete enough and distinctive enough to be assignable to identifiable taxa. One major problem with any attempt to classify passerines on the basis solely of skeletal material is that the skeleton itself shows a remarkable uniformity within the order. It is only with very recent techniques that microstructural differences have proven to show up features diagnostic for even the major groupings. It has aided the partial identification of some of the older fossils. Having said that, several passerines are worthy of mention. Although many can not be given names, some of these relate to the age and southern derivation of the group, while others show what can happen when passerines become isolated on islands.

One of the major controversies when dealing with the Passeriformes has been the timing of their appearance and spread. Due to the modern-day distribution of the suboscines, traditionally regarded as the oldest passerine suborder, it has been surmised that the Passeriformes have a southern origin, and that it is only with the advent of the oscines that the Passeriformes spread to the Northern Hemisphere. It was therefore timely that, in the mid-1990s, Australian passerine fossils of Early Eocene age were discovered from the Murgon range in south-east Queensland, thereby predating the oldest (Miocene) European fossils known at that time. However, like many passerine fossils, these were rather fragmentary in nature, and their identification to a recognisable taxon within the Passeriformes has proven impossible (Boles 1995). Recent studies have shown that the Acanthisittidae are the only extant members of a previously unrecognised group of ancient passerines (Acanthisittia) which are the sister-group to all other living passerines (Eupasserer) (Ericson, Christidis *et al.* 2002, Ericson, Irestedt & Johansson 2003). In 2004 and 2006, Mayr and Manegold reported on German and French passerines from the Early Oligocene, 10 million years before the time when the Passeriformes were thought to have entered Europe. These birds, originally described as suboscines, held further surprises, in particular that they fell outside the Eupasserer and could belong to a more primitive group. There were yet more surprises, as these primitive forms showed a finch-like bill for feeding on seeds or fruit, not insects, thus upsetting yet another hypothesis about passeriform evolution, which relied on an insectivorous ancestral form. Other European fossils have since been investigated more thoroughly and some, too, fall outside the living passerine groups, showing a wide radiation of so-called primitive passerines in Europe in the early Tertiary (Manegold *et al.* 2004, Mayr & Manegold 2006a). Some specimens belonging to this ancient European radiation have recently been given the name '*Weislochia weissi*' (Mayr & Manegold 2006b). The origins of the Passeriformes are still thought to be on the southern continent of Gondwana, as per the original observations. Many 'later' species of passerines are attributable to modern families, for instance the Miocene *Menura tyawanoides* of Riversleigh, Australia, and even among these we find geographical surprises, such as records of drongo in Pleistocene Europe. However, it is the island species that show the most interesting traits among the Passeriformes. For instance, only three species of passerine are truly flightless. One, the Stephens Wren (*Traversia lyalli*), still existed during European colonisation of New Zealand. The second is another New Zealand Wren, popularly-called the Long-billed Wren (*Dendroscansor decurvirostris*), a species whose overall appearance might have been similar to a rather small, fat-bodied treecreeper. This species probably became extinct during the Maori colonisation, although the species is only known from three sites, all on the South Island (Millener & Worthy 1991, Worthy 1998). Many of the New Zealand wrens show a trend towards flightlessness, so to find two truly flightless species among their number is probably not such a surprise, unlike the third species. This was an emberizid, described as the 'Long-legged Bunting' (*Emberiza alcoveri*) and found on the island of Tenerife in the Canaries. It occupied the Laurel forests of the island at least until the early Holocene. Larger than any living *Emberiza*, *E. alcoveri* was 39% heavier than one of its closest relatives, Cabanis's Bunting

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Passeriformes and relatives  
90 fossil species, 60 genera



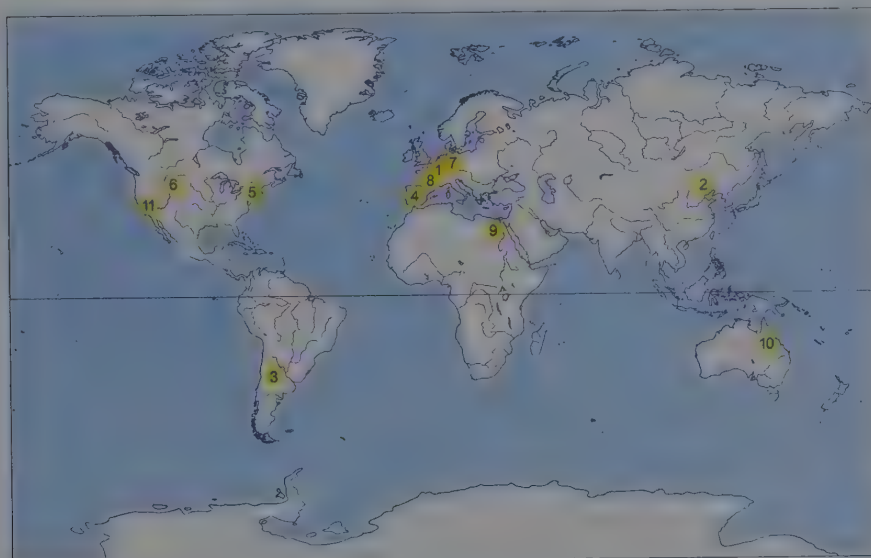
The flightless Long-legged Bunting (*Emberiza alcoveri*) was discovered in La Cueva del Viento, Tenerife. This outsize bunting either inhabited the laurel forest or the ecotone between the lowland laurel forest and the upland Canary pine forest. The reduction of laurel forest and introduction of terrestrial predators (black rats and feral cats) are thought to have led to its extinction.



The Hawaiian islands have lost a wealth of interesting species whose habits and niches we will probably never fully comprehend, and can only guess at. In the genus *Hemignathus* a number of species have vanished, including *H. vorpalis* and also *H. upuirostris*, a close relative. *H. vorpalis* (shown here) was the largest species in the genus, if not the largest in the family Drepanididae. This giant sported a greatly extended, curved upper mandible with which it probably probed into deep crevices for insects.

(*Emberiza cabanisi*) of Africa, and possessed longer legs and shorter wings. Like that species, it was a seed-eater, although in this particular case it was capable of feeding on the harder seeds characteristic of the island. *E. alcoveri* probably nested on the ground, in common with many island species where ground predators do not exist. It was this trait that led to the final demise of the species, when its island home was invaded by the first human colonists, who not only destroyed its fragile habitat, but also brought with them such exotic predators as cats and rats (Rando *et al.* 1999).

Among the other passerines, it is perhaps the Hawaiian honeycreepers that attract the most attention, firstly because of their extremes in bill shape, but also because their historical and prehistorical interactions with humankind make sober reading. Today, there are 23 species on the islands, but this is only what remains since the huge destructive forces of Polynesian and, later, European colonisation wiped out many of their relatives: one estimation suggests that as much as 64% of the native avifauna has disappeared from the Hawaiian islands to date. Some amazing adaptations existed among these 'pre-human' birds, and none more so than among the Drepanididae. For instance, the speciose genus *Hemignathus* has at least two additional species in the fossil record, one of which, *H. vorpalis*, was a giant (James & Olson 2003). *H. vorpalis* possessed an incredible, elongated upper mandible that the bird probably used to probe into deep crevices and sift through leaf litter to extract its insect prey. This bird became extinct on the island of Hawaii about 3000 years ago. A further 14 species of fossil and subfossil honeycreeper have so far been described, bringing the world's total up to 48; species are still being described (e.g. James 2004, James & Olson 2005). Several other species became extinct during European colonisation (see Fuller



World map showing some major sites for fossils.

1. **Solnhofen paleo-lagoons, Germany/Austria (Late Jurassic)**  
System of coastal lagoons important for the discovery of Archaeopteryx.
2. **Liaoning Province, China (Early Cretaceous)**  
Part of a vast region of northern China whose flora and fauna constitute the Jehol Biota. Sites within Liaoning and neighbouring areas provide the most comprehensive record currently known of an Early Cretaceous system—in this case a lacustrine/forest system. Famous, in particular, for its feathered dinosaurs and primitive birds.
3. **Lecho Formation, NW Argentina (Cretaceous)**  
Important site for the description of the Enantiornithes.
4. **Las Hoyas, Spain (Cretaceous)**  
Important site for the description of the Enantiornithes.
5. **Greensands, New Jersey, USA (Late Cretaceous/Early Paleocene)**  
Cretaceous / Early Paleocene birds.
6. **Green River Formations, SW Wyoming/SE Utah, USA (Lower Eocene)**  
Huge tropical lake system that underwent a similar change from fresh water to high salinity as that shown by the African Rift Valley.
7. **Messel, Germany (Eocene)**  
A site that provides a window on the flora and fauna near the beginning of the new diversification. Many of the species found in Europe from about this time suggest not only a direct link with North America, but also a possible land bridge with South America.
8. **Phosphorites du Quercy, France (Late Eocene to Late Oligocene)**  
Provides insight into the vertebrate fauna of the early Tertiary of Europe.
9. **Fayum Depression, Northern Egypt (Oligocene)**  
A site that provides one of the earliest and most complete records of the continental Tertiary flora and fauna of Africa.
10. **Riversleigh, NW Queensland, Australia (Miocene)**  
Important site for the window on Miocene Australia that it presents.
11. **Rancho La Brea Tar Pits, California, USA (Pleistocene)**  
Renowned for the variety of megafauna and scavenging carnivores that they have trapped.



2002), but whether this was due to European pressure or just the tail end of the original colonisation remains to be discovered. In reality, it was probably a mixture of the two, with the European influences putting the last nail in the coffin for many species, but causing the extinction of others that were still common. It is only recently that it has been realised how destructive the initial human colonisation of the Hawaiian islands was, and how diverse the original 'pristine' Hawaiian fauna had been.

### *Summary*

Although this overview has tried to be comprehensive in terms of the diversity of birds it has covered, the reader must be made aware that to do the subject justice would require far more space than can be given in HBW. Indeed, a whole book could be devoted to the subject (and many have been!). However, two features stand out above all the others. One is that of interpreting biogeographical patterns. Without the knowledge from fossils, what would our interpretation of such families as the swifts and nightjars been like? For instance, would we ever have discovered from other sources that hummingbirds used to be present in Europe? Probably not, although the discovery of nectarivorous birds in the European early Tertiary does clear up the little mystery of bird-adapted nectar plants, even if their presence was only investigated after the nectarivores were discovered. Also interesting in terms of biogeography is the closeness of the avifaunal assemblages of Europe and North America, which has provided the possibility that land bridges existed at various times between these two regions. The second feature that must stand out, other than the huge variety of bird forms that have existed, is the difficulty in interpreting those forms both phylogenetically and, even harder, in terms of habit and ecology. Although these latter can be tackled with educated guesses, we will never know for certain in the majority of cases what these birds ate, how they behaved, or even what they looked like in glorious technicolor.

New fossils are being discovered every day, or so it seems. While I have attempted to keep up with the most important of these, I know that I have not covered in any detail the relationships of the basal groups. As with any study, this article is already out of date before it has even gone into print, so please treat this as it should be—a celebration of the diversity that are the birds!

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*Text and illustrations by Dr Kevin J. Caley*

## Glossary

- Articulated fossil:** a complete fossil in which all the bones lie in the correct position, as they did when the animal died.
- Biogeography:** the study of distributions and ranges in organisms.
- Carinate:** of those birds whose primitive state involves the possession of a carina, or keel, on the sternal plate.
- Cladistics:** a philosophy of classification that arranges organisms only by their order of branching in an evolutionary tree, and not by purely morphological similarity. Thus, with cladistics, birds and theropods are placed together, whereas more traditional classifications would separate them.
- Cursorial:** of terrestrial animals adapted for speed rather than strength.
- Derived characters:** those which have evolved beyond the original form. For instance, the bill of a flamingo is highly derived from the standard 'generalist' bill morphology.
- Fossil:** the remains of a creature in which the bone and tissue have been replaced through a process of mineralisation, becoming rock-like in form. Trace fossils exist when tracks or faeces undergo a similar process. Particular environmental conditions must be met for fossilisation to occur.
- Furcula:** the 'wishbone', formed by the fusion of the two clavicles, or collar bones. Found in theropods, including birds.
- Genome:** the hereditary information encoded within an organism's DNA—its genetic make-up.
- Gondwana:** an ancient southern landmass encompassing what is now South America, India, Australia, New Zealand, Africa, Madagascar and Antarctica. Other continents were fused in a northern landmass, Laurasia.
- Graviportal:** megafaunal animals with massive bones and bodies, with columnar bones to carry weight; in consequence, their movements are restricted. Built for strength rather than speed in the first instance.
- Humerus:** upper arm/wing bone.
- Integuments:** hair, feathers, nails, skin, etc.—the natural outer covering of an organism.
- Jehol Biota:** consisting of the Yixian and Jiufotang Deposits, Early Cretaceous deposits from Liaoning, in the north of China. Famous for the discovery of *Confuciusornis*. Based on two different radiations of pterosaur, one group akin to that seen in the Late Jurassic of Europe, one to that seen in the Early Cretaceous of Brazil.
- Keel/Carina:** extension of the sternal plate on which the muscles of the wing are attached. In flightless species, this is often much reduced or even vestigial.
- K–T boundary:** Cretaceous–Tertiary boundary (from the German).
- Megafauna:** term used to encompass the giants of the fauna, e.g. elephant, rhino, ostrich.
- Mosaic species:** species in which characters of a variety of different groups are exhibited. Often, these mosaic species are basal examples before such groups split to become independent lineages.
- Mummy:** preserved specimens with flesh and integuments intact in such a way as that the organic material has not been replaced by rock minerals.
- Neoaves:** a taxonomic unit for all neognathous birds and including their ancestors, but excluding the Galloanserae.
- Neognath:** ('new jaw') any bird from the modern (neornithine) radiation that possesses the neognath palate. Among the neornithines, this excludes the tinamous, lithornes and ratites.
- Neotony:** retaining juvenile features into the adult phase of a life cycle, for instance the chick-like appearance of the adult ostrich.
- Osteology:** bone form; literally the study of bones.
- Palaeognath:** ('old jaw') a lineage of birds including the tinamous, lithornes and ratites. Palaeognaths and neognaths are distinguished by the anatomy of the palate.
- Pamprodactyl:** having all toes facing forwards, like the feet of a swift.
- Plesiomorphic:** primitive traits, found in the basal group and signifying an evolutionary lineage if found in more advanced species.
- Polyphyletic:** a taxon is said to be polyphyletic if the groups it contains possess different origins and come from different lineages.
- Pre-human birds:** birds that existed on islands prior to human colonisation. Most commonly used with reference to Pacific islands.
- Procoracoid:** the procoracoid bones lie posterior to the clavicles. They give support and stability to the pectoral girdle.
- Proto-feathers:** filamentous integumentary structures thought to be the precursors to true feathers. In reconstructions, often portrayed as hair-like or loosely structured.



- Pygostylia:** After Chiappe (1996), this includes all birds from *Confuciusornis* to Neornithes. The major characteristic of the group is the fusion of some or all of the tail bones into a solid structure, or pygostyle; this structure is not restricted to birds.
- Relictual distribution:** the distribution observed today, in which only part of an original range for the taxon in question is still occupied.
- Relictual species:** a species that is the last of its group, effectively a sort of living fossil.
- Saurischian:** 'lizard-hipped', including the sauropods (e.g. *Diplodocus*) and theropods. Birds originate from this group, rather than the other major dinosaur lineage, the ornithischian, or 'bird-hipped', group. The latter terms are essentially misnomers.
- Subfossil:** buried bones and tissue in which the mineralisation process has begun but is not complete.
- Switch-claw:** the enlarged claw of the inner toe of the Dromaeosauria and troodontids, usually held in a flexed position rather than flat on the ground like the other toes.
- Tarsometatarsus:** compound bone between the tibiotarsus and phalanges of a bird, formed by the fusion of the distal tarsal bones and the metatarsals.
- Theropods:** mainly bipedal carnivorous dinosaurs that include the ancestor of the birds (Aves). This grouping includes the Coelurosauria, among other groups. Characterised by thin-walled, hollow bones, hands and feet with three main fingers and toes.
- Tibiotarsus:** the large bone between the top leg bone (the femur) and the foot bones (tarsometatarsus) in a bird. Formed through the fusion of the long bone with the proximal bones of the ankle.
- Urvogel:** the earliest birds known, usually used in reference to *Archaeopteryx* and its closest relatives, if they are regarded as separate species.
- Vegetation mosaic:** a mixed zone in which patches of different habitat are intermingled with each other.
- Zygodactyl:** 'yoke-toed', in which two toes point forwards and two backwards (phalanges 1 and 4), as in a woodpecker.

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## *Introduction to Volume 12*

This volume completes the large block of species and families formerly all lumped together in a broad version of Muscicapidae, a block that we first dipped into in Volume 10. We now move on to the tit/creeper section of traditional classifications.

The foreword in the present volume presents one of the subjects that has been most frequently requested by our readers, namely an account of fossil birds and their nearest relatives. We are very pleased to welcome Kevin Caley as our invited author. He offers a lively, new approach to the subject, and has complemented his extensive knowledge with an outstanding set of sketches drawn specially by himself.

With the arrival of the passerines, it has become increasingly apparent that for a number of families there is nothing of real relevance to comment under the Relationship with Man section. If authors are unable to find anything at all appropriate, rather than going through the motions we have decided to permit the exception of leaving this particular section blank. Nonetheless, we do hope that this will only be the case in relatively few families, for there are certainly others with a great deal of potential interest on offer.

For any readers who might be uncertain, we repeat brief definitions of a couple of terms that occur repeatedly in the Status and Conservation sections. As defined by BirdLife International, a "restricted-range species" is one which throughout historical times is reckoned always to have had an overall breeding range of under 50,000 km<sup>2</sup>. An Endemic Bird Area (EBA) is an area within which the overlapping breeding ranges of at least two restricted-range species are wholly encompassed. Following the figures published in recent years, restricted-range species account for some 27% of the world's avifauna, or about 2600 species, and these are restricted to about 220 EBAs, which in turn support roughly 75% of all globally threatened bird species. They are thus areas of high priority for conservation, all the more so as they tend equally to be centres of endemism for other life forms.

We have several assorted remarks to make on the subject of bibliography. These are of varying relevance for the present volume, for others to come, and for the series as a whole.

First of all, we have been delighted to welcome Dr Frank D. Steinheimer to the HBW team, to take over the important task of matters bibliographical. As a member of the Standing Committee on Ornithological Nomenclature, and a Research Fellow of the Museum für Naturkunde der Humboldt-Universität in Berlin, Frank is exceptionally well placed to contribute to the project. We are particularly grateful to the museum for allowing Frank to use its many resources for his work with HBW.

In all the volumes to date, whenever there has been any doubt about any aspect of an original description our aim has been to examine the original work ourselves, or have it checked by one of the several experts who have so kindly and freely given us their assistance time and again. We have never before quantified this process, but for the present volume we are in a position to present figures, in case these might be of interest to any readers. The 1020 references of original descriptions presented here are mainly based on the information given in J. L. Peters's *Check-list* (vols 10–12: 1964, 1967, 1986), out of which 465 entries have been checked for correctness by the HBW team; an annotated list has been kept of which descriptions have been seen as originals. Anyone in doubt with regard to any reference is invited to address the query to us (lynx@hbw.com).

In addition, we have a couple of short notes in connection with particular references:

**Lesson** (1835). *Oeuvres Compl. Buffon* 9: 139 [*Mohoua*]. This reference is copied from Mayr (1986b). We have been unable to confirm this original description and have only located a reference to the new genus *Mohoua* from **Lesson** (1838). *Compléments de Buffon*, 2nd edition, 2: 529.

and

**Oustalet** (1876). *Bull. Soc. Philom. Paris Ser. 6, no. 13*: 92 [*Dryonastes berthemyi*]. Deignan (1964b) and Dickinson (2003) are followed here for the citing of the publication dates. *Bull. Soc. Philom. Paris* was published in an irregular order, and will be subject of a forthcoming paper (Edward Dickinson, *in litt.* 6 June 2007).

While on this subject, we feel that it would be appropriate to acknowledge the great value for us of the Howard and Moore *Checklist* 3rd edition (2003). This major contribution has already picked up on a great many of the uncertainties emanating from the Peters *Check-list* combined with taxonomic developments, and the editor, Edward Dickinson, is always quick to resolve any issues upon which we have consulted him.

Readers are reminded once again that HBW Bibliography sections are not solely a collection of the source documents consulted, but also include an element of "suggested further reading". Thus, although 95–100% of the literature cited will have been consulted, there remains a small element of references which we believe may be useful for the reader looking to go into greater detail, but which neither authors nor the editorial team have consulted. It should perhaps be stressed that large reference works containing so much material that they might significantly add to the content of the text are only cited if they have indeed been consulted.

The present volume is the first in which we have included references from the Internet. We were at first somewhat hesitant, in part due to the very variable quality of material to be found on the Web, and also to the potentially transitory nature of some of it, but if treated with care, there is a great deal of useful information exceptionally accessible to the majority of readers, so we have now decided to permit such references, with appropriate caution.

And finally, we have a short note with regard to Chinese names. As these are, of course, necessarily transliterations, there is always the chance of some variance in spelling, when using the Roman alphabet. We have come across cases of the same author being cited using different transliterations in different publications, with the result that the same author can turn up under different names even within a single Bibliography section. In the end it seemed to us that it would cause more confusion to unify such names throughout our bibliography, as this would mean that readers might find themselves looking for, or even ordering, an article that actually appears under a different name. At the same time, we can not be sure that we would detect all such cases anyway. We beg understanding from anyone implicated, and sincerely trust that nobody feels in any way ill-treated.

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For the checking and editing of the bibliographies and scientific descriptions, libraries and their online catalogues have been particularly helpful, especially the Museum für Naturkunde in Berlin, the British Museum of Natural History at Tring, Deutsche Ornithologen-Gesellschaft in Berlin, the Muséum National d'Histoire Naturelle in Paris, the American Museum of Natural History in New York, the Library of Congress in Washington, the British Library in London, and the Preußische



Staatsbibliothek in Berlin. At the same time, we should like to compliment the extremely useful on-line taxonomy resource ([www.zoonomen.net](http://www.zoonomen.net)) maintained by Alan P. Peterson in Walla Walla, Washington.

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# PASSERIFORMES

- Eurylaimi
  - Eurylaimidae (Broadbills)
  - Philepittidae (Asities)
  - Pittidae (Pittas)
- Furnarii
  - Furnariidae (Ovenbirds)
  - Dendrocolaptidae (Woodcreepers)
  - Thamnophilidae (Typical Antbirds)
  - Formicariidae (Ground-antbirds)
  - Conopophagidae (Gnateaters)
  - Rhinocryptidae (Tapaculos)
- Tyranni
  - Cotingidae (Cotingas)
  - Pipridae (Manakins)
  - Tyrannidae (Tyrant-flycatchers)
- Acanthisittae
  - Acanthisittidae (New Zealand Wrens)
- Menurae
  - Atrichornithidae (Scrub-birds)
  - Menuridae (Lyrebirds)
- Oscines
  - Alaudidae (Larks)
  - Hirundinidae (Swallows)
  - Motacillidae (Pipits and Wagtails)
  - Campephagidae (Cuckoo-shrikes)
  - Pycnonotidae (Bulbuls)
  - Chloropseidae (Leafbirds)
  - Irenidae (Fairy-bluebirds)
  - Aegithinidae (Ioras)
  - Ptilogonatidae (Silky-flycatchers)
  - Bombycillidae (Waxwings)
  - Hypocoliidae (Hypocolius)
  - Dulidae (Palmchat)
  - Cinclidae (Dippers)
  - Troglodytidae (Wrens)
  - Mimidae (Mockingbirds and Thrashers)
  - Prunellidae (Accentors)
  - Turdidae (Thrushes)
  - Muscicapidae (Old World Flycatchers)
  - Platysteiridae (Batises and Wattle-eyes)
  - Rhipiduridae (Fantails)
  - Monarchidae (Monarch-flycatchers)
  - Regulidae (Kinglets and Firecrests)
  - Polioptilidae (Gnatcatchers)
  - Cisticolidae (Cisticolas and allies)
  - Sylviidae (Old World Warblers)
  - Picathartidae (Picathartes)
  - Timaliidae (Babblers)
  - Paradoxornithidae (Parrotbills)
  - Pomatostomidae (Australasian Babblers)
  - Orthonychidae (Logrunners)
  - ...
- ...
  - Eupetidae (Jewel-babblers and allies)
  - Pachycephalidae (Whistlers)
  - Petroicidae (Australasian Robins)
  - Maluridae (Fairy-wrens)
  - Dasyornithidae (Bristlebirds)
  - Acanthizidae (Thornbills)
  - Ephianuridae (Australian Chats)
  - Neosittidae (Sittellas)
  - Climacteridae (Australasian Treecreepers)
  - Paridae ( Tits and Chickadees)
  - Remizidae (Penduline Tits)
  - Aegithalidae (Long-tailed Tits)
  - Sittidae (Nuthatches)
  - Tichodromadidae (Wallcreeper)
  - Certhiidae (Treecreepers)
  - Rhabdornithidae (Philippine Creepers)
  - Nectariniidae (Sunbirds)
  - Melanocharitidae (Berrypeckers and Longbills)
  - Paramythiidae (Painted Berrypeckers)
  - Dicaeidae (Flowerpeckers)
  - Pardalotidae (Pardalotes)
  - Zosteropidae (White-eyes)
  - Promeropidae (Sugarbirds)
  - Meliphagidae (Honeyeaters)
  - Oriolidae (Old World Orioles)
  - Laniidae (True Shrikes)
  - Malaconotidae (Bush-shrikes)
  - Prionopidae (Helmet-shrikes)
  - Vangidae (Vangas)
  - Dicuridae (Drongos)
  - Callaeatidae (Wattlebirds)
  - Grallinidae (Magpie-larks)
  - Corcoracidae (White-winged Chough and Apostlebird)
  - Artamidae (Woodswallows)
  - Pityriaseidae (Bornean Bristlehead)
  - Cracticidae (Butcherbirds)
  - Paradisaeidae (Birds-of-paradise)
  - Ptilonorhynchidae (Bowerbirds)
  - Corvidae (Crows)
  - Sturnidae (Starlings)
  - Passeridae (Old World Sparrows)
  - Ploceidae (Weavers)
  - Estrildidae (Waxbills)
  - Viduidae (Indigobirds)
  - Vireonidae (Vireos)
  - Fringillidae (Finches)
  - Drepanididae (Hawaiian Honeycreepers)
  - Parulidae (New World Warblers)
  - Cardinalidae (Cardinals and allies)
  - Thraupidae (Tanagers)
  - Emberizidae (Buntings and allies)
  - Icteridae (New World Blackbirds)



## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family PICATHARTIDAE (PICATHARTES)



- Relatively large passerines with long, broad tail, disproportionately large bill, relatively long and muscular legs; plumage dark above and whitish below, with bare skin of head brightly coloured.
- 33–38 cm.



- West and western Central Africa.
- Rainforest, extending into farmbrush and second growth.
- 1 genus, 2 species, 2 taxa.
- 2 species threatened; none extinct since 1600.

## Systematics

The family Picathartidae comprises a single genus with just two species, the White-necked Picathartes (*Picathartes gymnocephalus*) and the Grey-necked Picathartes (*Picathartes oreas*). Both are restricted to the rainforest belt of West and Central Africa. The former ranges from Guinea and Sierra Leone east to Ghana, and the Grey-necked Picathartes occurs in south-east Nigeria, west and south Cameroon, Equatorial Guinea, including Bioko, and Gabon, with one record in PR Congo.

The systematic position of the picathartes has been the subject of long-running controversy. The genus has been variously placed with the crows (Corvidae), the starlings (Sturnidae), the Old World flycatchers (Muscicapidae), the babblers (Timaliidae) and the Old World warblers (Sylviidae). It is now accorded separate family status by most authorities, and is usually positioned near the thrush-babbler assemblage.

In the late nineteenth century, in the earliest attempts to classify *Picathartes*, taxonomists placed the genus in the family Corvidae. This original view was subsequently supported by various authorities, including D. A. Bannerman, in 1948, and W. Serle, in 1952. After having seen the species alive, Bannerman gave *Picathartes* a family of its own, Picathartidae, which he placed next to Corvidae. Serle noted that *Picathartes* eggs were corvine-like, and that there was "remarkable similarity" in form and proportion between *Picathartes* and the Rail-babbler (*Eupetes macrocerus*) of the Malay Peninsula, Sumatra and north Borneo.

In 1938, P. R. Lowe removed the picathartes from the Corvidae and incorporated them as a subfamily, Picathartinae, in the Sturnidae, a decision based on anatomical examination of preserved *Picathartes* specimens. C. W. Mackworth-Praed and C. H. B. Grant followed this classification in their 1973 treatment of the birds of the western parts of Africa.

J. Delacour and D. Amadon had concluded that *Picathartes* had far more in common with the babblers than it had with the starlings, the crows or other passerines. From a review of the birds' behaviour, and examination of internal anatomy, they suggested, in 1951, that the genus was an aberrant member of the thrush-babbler assemblage which should be included as a sixth tribe, the Picathartini, in the subfamily Timaliinae within the family Muscicapidae. This view, that *Picathartes* was a close relative of the babblers, gained wide support from various researchers until the 1980s. During the 1970s, supporters included C. G. Sibley, who undertook comparative electrophoretic studies of the

patterns of egg-white protein, B. P. Hall and R. E. Moreau, who based their opinion on the available anatomical and behavioural evidence, and S. L. Olson, whose comparative studies included habitat, behaviour and morphology. The closest living relatives of *Picathartes* were thought probably to be members of the African timaliid genus *Turdoides*. The one discordant voice in this period was that of K. E. L. Simmons, who in 1963 pointed out that, unlike most babblers, *Picathartes* scratched its head by the indirect method, by bringing the foot over the wing.

Sibley and colleagues, in their 1988 classification of the living birds of the world based on the results of DNA-DNA hybridization studies, initially placed *Picathartes* with the babblers in the tribe Timaliini within the family Sylviidae, which was deemed to belong in the "parvorder" Passerida. In work published two years later, however, Sibley and B. L. Monroe included the genus in a full family in the limbo of "Parvorder *Incertae Sedis*", on the boundary between the Corvida and the Passerida. It was felt that, on the available DNA evidence, it was impossible to determine whether *Picathartes* was a member of the Corvida or of the Passerida. These authors cautiously speculated, however, that the rockjumpers of South Africa, the genus *Chaetops*, could be the closest relatives of *Picathartes* and that the lineage of the two genera may have branched from that of the other Corvida soon after the divergence between the Corvida and the Passerida. A consideration of anatomical evidence, specifically the structure of the humerus, in addition to DNA comparisons, led the authors to believe that, on balance, *Picathartes* was probably a member of Corvida. A recent study by S. Treplin & R. Tiedemann, using retrotransposon insertions as phylogenetic markers, goes further and supports a close link with the family Corvidae itself.

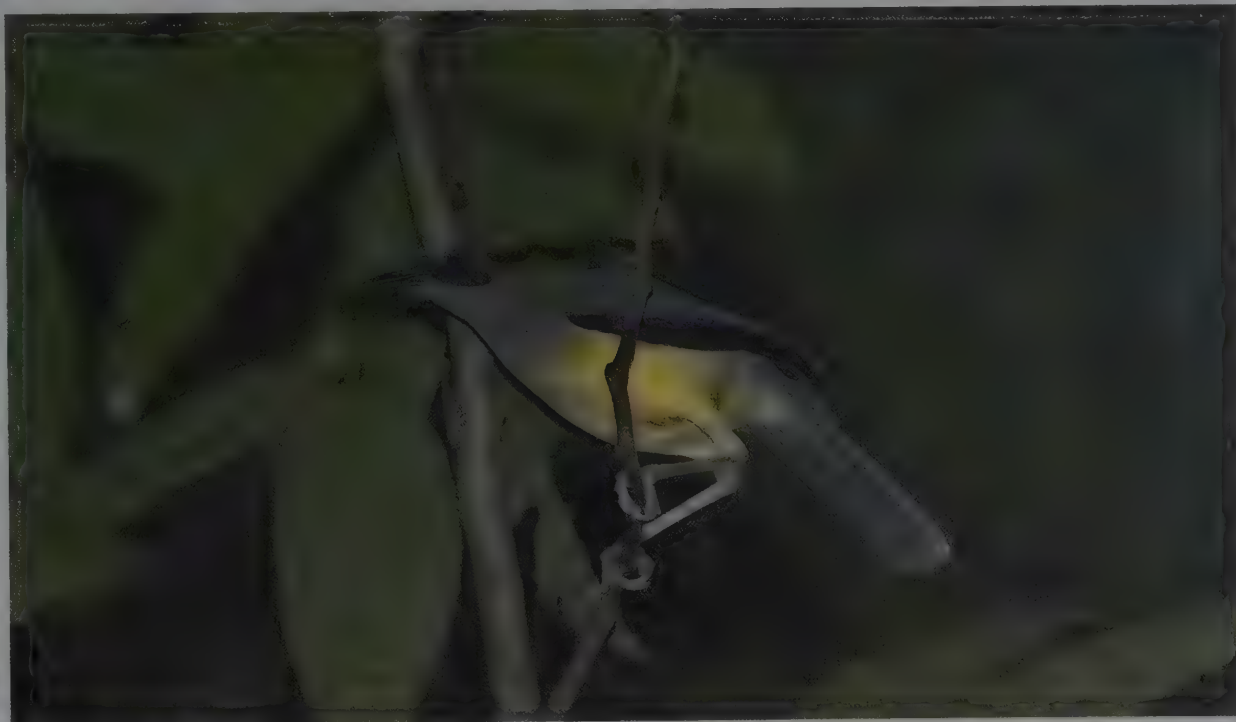
Analysis of DNA sequences in blood samples by H. S. Thompson, however, suggested that *Picathartes* is more closely related to the Passerida than to the Corvida. This is contrary to the tentative conclusions of Sibley and J. E. Ahlquist, in 1990, that *Picathartes* is a member of the Corvida, but it accords with the traditional views of Delacour and Amadon, among others, that the taxon is related to the thrush-babbler assemblage. The debate continues, as the databank continues to grow.

## Morphological Aspects

The two picathartes are beautiful, bizarre-looking birds with a bare brightly coloured head. In appearance, they look like a cross

The two members of Picathartidae are unmistakable birds of the West and west Central African forests. The **Grey-necked Picathartes** is almost entirely bald, with a few minute erectile crest feathers, a carmine nape, a powder-blue forecrown, and black parietal patches on the face. The taxonomic position of the family is unclear. It is believed by some to be related to the babblers (Timaliidae), and perhaps closest to the rockjumpers (Chaetops), although recent work suggests a possible close link with the crow lineage.

[*Picathartes oreas*,  
Korup National Park,  
Cameroon.  
Photo: Ketil Knudsen]



between a gamebird (Galliformes) and a crow, and they cannot be mistaken for any other species. Weighing about 200–250 g, these large birds are grey-brown or blackish in plumage above and whitish below. The skin of the bare head, including the nape, of the White-necked Picathartes is yellow, whereas that of the Grey-necked Picathartes is carmine on the hindcrown and nape and powder-blue on the forecrown. Two conspicuous black parietal patches form a black triangle on each side of the head, almost meeting at the back of the head. The bald crown bears a minute erectile crest consisting of a few tiny feathers, 6–8 mm in length, that are visible only at very close range when the bird is in the hand. A disproportionately large crow-like black bill, about 30 mm long, dominates the head, and indeed one of the alternative English names for these species is “bald crows”, a term not entirely inappropriate. The silver-grey legs are relatively long and muscular, well suited for the usual mode of progression of picathartes, which is by a series of surprisingly graceful hops and bounds along the forest floor.

Sustained flight by these species is rare, although the wings are moderately sized. The long, broad tail, considerably longer than the body, is frequently used as a means of maintaining balance on vines and branches.

Close examination of the plumage shows that the whitish ventral feathering of the White-necked Picathartes is washed with pale lemon-yellow, grading into pale yellow on the throat and upper belly. The Grey-necked Picathartes has a grey wash on the throat and chest. Its dorsal side is slate-grey, as opposed to the grey-brown of the White-necked Picathartes, and the primaries form a very distinctive black band separating the slate-grey of the back from the yellowish colour of the vent.

The sexes are alike, with no evident differences between them in plumage, eye colour and leg colour. Of 25 White-necked Picathartes examined in the field, all had the pupil blue-black and the iris brown, and Thompson found the body mass of this species to be 192–254 g, with an average of 219.2 g. Mean adult body measurements for the bill, the tarsus, the wing and the tail were, respectively, 33.1 mm, 63.8 mm, 163.8 mm and 182.8 mm. Six adult Grey-necked Picathartes weighed by C. G. R. Bowden in the 1980s had an average mass of 226.5 g, the lightest being 202 g and the heaviest 239 g. Measurements of eleven museum skins of this species were similar to those of live White-necked Picathartes measurements but slightly smaller, probably as a result of shrinkage; for the Grey-necked Picathartes, the average lengths were 37 mm for the bill, 49.4 mm for the tarsus, 158.3 mm for the wing and 155.2 mm for the tail. Museum-skin measure-

ments further suggest that Grey-necked Picathartes males are larger than the females, this sexual size difference being most detectable in the tarsal measurements.

Comparison of museum skins of the two species, made by Thompson, indicate that the White-necked Picathartes is larger in size than the Grey-necked Picathartes, but that the latter has a larger bill.

## Habitat

Typical habitat for picathartes is lowland rainforest at up to 800 m in elevation, in rocky, hilly terrain on the slopes of hills and mountains. Hill slopes with nesting sites of these species are usually inclined at an angle of 20°–49° to the horizontal, and normally less than 100 m from running water in the form of rivers and streams, as wet mud is essential for the purposes of nest-building. The presence of inselbergs makes the occurrence of these birds more likely. Rocks, cliffs or caves are required for nesting sites, and forest litter and undergrowth for foraging. In addition, a forested area large enough to contain army-ant (Dorylinae) swarms is more likely to harbour picathartes, too.

Picathartes habitat has traditionally been regarded as being remote from human habitation, and fairly undisturbed. In the 1990s, however, members of this family were recorded in more disturbed habitats, such as forest clearings, farmbrush and secondary growth. For example, a comprehensive survey of White-necked Picathartes colonies in Sierra Leone, carried out by Thompson, revealed that, although 70% of colonies were in secondary forest, a substantial number, 20%, were in farmbrush or forest regrowth; primary forest and cocoa plantations each held 5% of the total of 56 colonies found. Detailed habitat analysis showed that nesting sites abandoned by picathartes had lower tree densities, smaller trees and less canopy cover than did sites which were still used for breeding. This implied that habitat degradation probably caused the birds to move away from what were previously suitable nesting sites. On the other hand, picathartes have been found breeding also at sites quite close to human activity, such as less than 30 m from a maize (*Zea mays*) plot in Cameroon and 50 m from a charcoal-production pit in Sierra Leone, as well as in forest regrowth where complete forest cover was lacking. This suggests that the family is tolerant of fairly high levels of disturbance and that it can continue to exist in highly degraded habitat. It also calls into question the extent of the two species' dependence on forested habitat for survival.



## General Habits

Picathartes are rare forest-dwelling species. Compared with many other rainforest birds, they are relatively hard to see, partly because their populations are small and the breeding habitat is usually fairly inaccessible. For the most part, however, their quick and silent evasive reaction to any untoward movement or sound means that a human observer has to be extremely lucky to detect them away from their breeding sites. Nevertheless, once located by a cautious and quiet observer, or when at a breeding colony, the picathartes can be quite bold and confiding, even coming to inspect the observer. In 2006, E. Williams described how he was surrounded by "hissing and growling birds" at what is probably the world's largest Grey-necked Picathartes colony, that in the Dja Forest, in Cameroon.

Away from breeding colonies, these species are almost always encountered in primary or secondary forest, usually singly or in pairs, but occasionally in small groups of three or four individuals. They spend most of their time in foraging on the forest floor or on low vegetation, usually not more than one metre in height, although the Grey-necked Picathartes has been reported as occasionally hunting among bat guano in the caves where it breeds. Picathartes are frequent followers of columns of carnivorous ants, and are often found at these columns while foraging for flushed prey. Occasional sightings in forest clearings, in farmbrush and in forest where manual tree-felling is taking place suggest that these birds may range over a fair-sized area, utilizing non-forest habitats to a certain extent, and that, as mentioned above (see Habitat), they may not be over-sensitive to low levels of disturbance.

At breeding sites, several individuals may be seen at dawn or dusk throughout the year. Picathartes make regular visits to their nesting sites even outside the breeding season, and may roost in the vicinity in all months of the year. Typically, several birds congregate at a nesting site in the evenings and then leave at dusk, heading in different directions, singly or in pairs, to roost in nearby trees. While at the nesting site, the birds engage in various activities, such as nest-repairing, perching on nest rims, hopping about, preening, bathing, foraging and chasing one another. Allopreening has been observed, but it appears to be rare in this family.

Occasionally, as the egg-laying period approaches, chasing escalates into a peculiar group interaction involving pursuit sequences and a bowing display. In the latter display, an individual, while facing one or more others, makes a deep bow during which it holds the wings fully or partially raised, the effect being to present the coloured crown and black ear patches at the other bird or birds in the immediate vicinity. Each bow is usually followed by feather-ruffling and tail-shaking. The significance of this behaviour is uncertain, and it has been described variously as "peculiar individual behaviour", a "formalized display associated with roosting or breeding", "pre-group-roosting-intention display" and "group interaction behaviour associated with breeding".

## Voice

Both species of picathartes are usually silent, but they are known to make a variety of calls in different contexts, including the following.

When disturbed or threatened, the individual utters an alarm call. That of the White-necked Picathartes is a long drawn-out "aaoww", "kaaa" or "raaa" and is surprisingly loud. The alarm call of the Grey-necked Picathartes is also long and drawn out, but somewhat more muffled; it has been described by I. Sinclair and P. Ryan as "soft, protracted and sibilant".

Churring sounds are emitted by group-members during gatherings prior to roosting or breeding. These have sometimes been described as "hissing and growling".

A melodious whistling is used as a contact call between fledglings and adults of the White-necked Picathartes as the former leave the nest. In addition, an "owoooh" contact call between fledglings and adults is sometimes used as an alarm call by the adults.



The White-necked Picathartes differs from its sole congener most notably in having the bare skin on its head yellow. Both Picathartes are rare and elusive, and very difficult to see away from their breeding colonies. These colonies are found deep in rainforest, but also in secondary forest and partially degraded areas close to agricultural fields and human settlements.

[Picathartes gymnocephalus, West Africa. Photo: Kevin Schafer/ NHPA]

Grey-necked Picathartes sometimes emit a low, quiet drawn-out rasping or hissing "wheet" call lasting 1–2 seconds, generally repeating this several times at intervals of approximately four seconds. This vocalization is probably the same as the call which has been likened to the sound made by "heavy furniture being pushed across a gritty wooden floor".

Finally, the White-necked Picathartes has been described as uttering evenly spaced clucks in a series lasting for a minute or more. These sounds resemble those given by a domesticated chicken (*Gallus*), and are given at rates varying from four in 3 seconds to eight in 5 seconds. It has been suggested that this vocalization may possibly represent a song, but further study is required in order to elucidate this.

## Food and Feeding

The food of the picathartes is dominated by insects and other forest-floor invertebrates. Beetles (Coleoptera), termites (Isoptera) and ants (Hymenoptera) seem to be the most commonly occurring insect prey among identified items in the diet, while the other invertebrates taken are primarily earthworms (Oligochaeta), millipedes (Diplopoda) and centipedes (Chilopoda). In addition, small vertebrates in the form of frogs and lizards are taken, but most, if not all, of these appear to be presented to the nestlings. Within these broad parameters, however, the picathartid diet seems, on the whole, to be fairly diverse and generalized, with more than 25 other prey categories identified, including spiders (Araneae), crabs (Decapoda), snails (Gastropoda), and ticks and mites (Acarina). Some plant material, chiefly of angiosperms and mosses, is occasionally consumed.

Detailed analyses of stomach contents undertaken by several ornithologists, direct observations by H. Tye, faecal analysis by Thompson and, most recently, crop-content analysis by A. I. Adeyemo and I. A. Ayodele have all revealed insects as being numerically the main constituents of the picathartes diet. In these studies, the predominant insect prey were beetles of such families as Carabidae, Scarabaeidae, Elateridae, Anthribidae, Curculionidae and Staphylinidae, cockroaches of the family Blattidae, orthopterans of the family Tettigoniidae, earwigs of the family Forficulidae, termites of the family Rhinotermitidae, *Dorylus* ants, heteropteran bugs, and butterflies and moths (Lepidoptera).

Although insects dominate the diet in terms of prey diversity and numerical abundance, earthworms and small vertebrates seem to be the most important food resources in respect of biomass, at least for the nestlings. In a study carried out in Sierra Leone in the 1990s, it was found that more than 80% of the biomass in the diet of White-necked Picathartes nestlings was made up of earthworms, frogs and lizards.

The fact that the picathartid diet contains such items as carabid ground beetles and earthworms, coupled with direct observations in the field, indicates that these two species forage mainly on the

soil surface and in low undergrowth. Nevertheless, Adeyemo and Ayodele, on the basis of their study in Nigeria, described the Grey-necked Picathartes as an arboreal feeder. In addition, however, it is evident that picathartes occasionally forage in flowing water, such as streams. This is indicated by the fact that crabs found mainly in streams have been identified in White-necked Picathartes droppings, and fish have been found in the crops of Grey-necked Picathartes caught near a Nigerian river.

On the ground, these species normally move in series of long bounds and graceful hops interspersed with pauses. The bill is the primary foraging tool, used for turning over and tossing aside leaves and for capturing prey. The feet are hardly ever used for acquiring food. Both species also leap upwards to snatch prey from foliage.

Both members of the family are known to follow swarms of carnivorous doryline ants (see General Habits), where they frequently forage ahead of or among the ants. As with the majority of ant-following bird species, however, this is mainly in order to capture prey flushed by the ants.

In conclusion, the two picathartes species seem to have a fairly diverse, generalized diet. This could confer a high degree of adaptability, enabling them to exploit different prey items if their preferred food became scarce or unavailable. An unspecialized diet is often associated also with a widespread distribution and rapid colonization of new environments. This suggests that the restricted range of the genus and the apparently small size of the populations of the two species are not related to their ability to find food.

## Breeding

Both species of picathartes generally breed in the wet season, apparently nesting twice per year in areas where rainfall distribution is bimodal. In fact, eggs and nestlings can be found in any month of the year, partly because wet seasons occur at different times in different parts of the species' ranges but also because, in montane areas, breeding takes place in the dry season. This is

known to be the case on Mount Nimba, in Liberia, and on Mount Cameroon. This habit of dry-season breeding may have been adopted because of the very high rainfall and frequent mists during the wet season at high altitude, a factor which is known to constrain wet-season breeding severely among montane birds.

The breeding season of the White-necked Picathartes in Guinea is July–January. In Sierra Leone, the laying period extends from June to December, with a peak in October, and nestlings can be found from August to January, with highest numbers in November. Laying dates in Liberia cover the period September–December, the majority falling in October, with a second period in March, May and July; here, laying in the dry-season months of December and March may be explained by differences in timing of breeding at high-altitude locations such as Mount Nimba. Breeding has been recorded in March, April and May in Ivory Coast and in March–June and September–November in Ghana.

Somewhat farther east, the Grey-necked Picathartes has been recorded as breeding in August–November in Nigeria. On Mount Cameroon, this species breeds in the December–January dry season, but elsewhere in Cameroon nesting takes place in March–November, with a peak between August and November. The breeding season in Gabon is November–April, whereas there are as yet no documented breeding records of the species from Equatorial Guinea or from PR Congo, although it seems unlikely that the details would be substantially different from those elsewhere in the range.

Very unusually for a rainforest bird, *Picathartes* builds mud nests on rock surfaces, cliffs and cave roofs, hence the popular alternative name of “rockfowl”. Most rock surfaces selected by the two species slope forwards at an angle of at least 10°–20°, or the nest is built below an overhang or rock pelmet, presumably to afford protection from rain and water run-off. Nests have occasionally been found in unusual places, as, for instance, in 1999, when M. Waltert and M. Mühlenberg discovered a Grey-necked Picathartes nest attached to the buttress root of a large *Piptadeniatrium* tree 1.5 m above ground near a small forest stream.

**The Grey-necked Picathartes** was once thought to breed cooperatively, but it now seems clear that it is socially monogamous. The female typically lays two eggs, although less often clutches may be of one or three eggs. The nest is decidedly peculiar: a cup-shaped structure made of dried mud packed with leaves, plant fibres and twigs. Both Picathartes are very particular about where they put these nests, almost always attaching them to overhanging rock surfaces, cliffs and caves, presumably to afford protection from rain. They often nest colonially, with the largest known colony of Grey-necked Picathartes, at Dja in south Cameroon, containing over 40 pairs.

[*Picathartes oreas*,  
Korup National Park,  
Cameroon.  
Photo: Ketil Knudsen]





Picathartes nests are cup-shaped structures of dried leaves, fibres and twigs embedded in a strong matrix of dried mud. Sixty-three nests of White-necked Picathartes had average measurements of 108 mm in length, 172 mm in width and 129 mm in depth, but individual sizes varied by as great a factor as six for some dimensions. There is similar considerable variation in the size of Grey-necked Picathartes nests, but R. M. Bian and colleagues gave the measurements of a typical nest as 400 mm long by 290 mm wide and 140 mm thick.

Breeding by these species is usually described as colonial, with up to 40 or more pairs of Grey-necked Picathartes recorded at a single nesting site, as, for example, in Dja Forest, in Cameroon. A review of 37 White-necked Picathartes sites in Sierra Leone in the 1990s, however, found that most contained only one or two nests, the maximum number at one site being eleven. The mean colony size was 2.27 nests. Of a total of 78 nests, the majority, 68%, were 1.5–2.5 m above the ground, and more than three-quarters were spaced at 1–1.5 m from the nearest neighbour. Grey-necked Picathartes are thought to breed colonially where nest-sites are limited, the majority of colonies consisting of two to five nests, but this species is not a colonial breeder on Mount Cameroon, where nest-sites are abundant, and it possibly does not breed in colonies at all on Bioko. Six nests found by Tye on Mount Cameroon were all solitary, rather than in colonies, with no other nest within 400 m of an active nest.

Contrary to some early suggestions of co-operative breeding, it is now almost certain that picathartes breed only in pairs. Pairs of White-necked Picathartes are aggressive towards conspecifics which approach their nests to within less than a metre or so, and vicious fights sometimes occur. Outside the breeding season, at least, groups of 6–12 individuals sometimes gather at roosting sites and engage in group displays involving chases and bowing, as described earlier (see General Habits). It is uncertain whether these displays have any connection with breeding.

Picathartes usually lay two eggs in the wet season, but sometimes one or three eggs may be laid. Of 77 White-necked Picathartes clutches examined in Sierra Leone, 71 were of two eggs and only six contained a single egg; the mean clutch size was of 1.92 eggs. Similarly, only one of 16 clutches laid by Grey-necked Picathartes in a west Cameroon study was of one egg, the remaining 15 all consisting of two eggs.

Measurement of 47 White-necked Picathartes eggs produced an average size of 25.8 mm × 38.3 mm, with a range of 20–28 mm × 30.4–42 mm. The mean weight of freshly laid eggs was 14.5 g, which is equivalent to 6.6% of the mean adult body weight. In four clutches monitored, the eggs lost about 14% of their initial fresh weight during incubation, an average of 0.122 g per day. The weights and dimensions of Grey-necked Picathartes eggs are similar to those of this species' congener; four eggs from two clutches found about half-way through the incubation period in Cameroon weighed from 14.7 g to 16 g, and their sizes were 27–28 mm × 39.6–41.7 mm. Grey-necked Picathartes eggs are apparently quite variable in appearance. They have been described variously as pale grey with brown mottling, as dark fawn with dark brown blotches, and as creamy white with blotches and/or spots of chocolate-brown, olive-green or grey; another description is "pale green with a deep layer of grey spots and a superficial layer of olive-green spots". White-necked Picathartes eggs are much less variable, most being creamy white with sepia and dark brown mottled blotches and other markings, these usually denser at the larger end of the egg.

The eggs are laid 24–48 hours apart. The White-necked Picathartes begins incubation on the day when the first egg is laid, whereas the Grey-necked Picathartes is said to start incubating only when the clutch is complete. Estimates of the incubation period range from 17 days to 28 days, with a median of 20 days in the most quantitative study to date, that of six White-necked Picathartes nests. The parents take turns to incubate the eggs, which hatch at an interval of at least 12 hours. The nestling period at the six White-necked Picathartes nests ranged from 23 to 29 days, the average being 25.3 days. The nestling period of the Grey-necked Picathartes is evidently about 24 days.

On hatching picathartes nestlings are blind and naked, except for three to four bristles on the crown and a single row of

white down along the spine. Fine down may be present also in lines along the wing bones and the femur. The body is translucent pink below and light brown above, with black wing buds. The primary and secondary quills begin to grow about two days after hatching, and the tail feathers and tertials appear from days 5–7. The eyes open from day 4 or 5. The conspicuous black ear patches characteristic of adults (see Morphological Aspects) are nowhere to be seen on the hatchling, but they become distinct from about day 7 as light brown or flesh-coloured patches. At this stage, when the chick is about one week old, the bill is pale brown, almost yellow, instead of black, and it has a white rim around the edges of the mandibles. The legs are pale grey.

From about one week of age, the nestlings may start to make begging calls when adults approach the nest. From 8–10 days, they defecate over the side of the nest; before this stage, faeces are deposited in the nest, and the parents consume faecal sacs or remove them from the nest. During the second and third weeks of its life, the nestling's wing and tail feathers erupt from pin and grow rapidly, followed by the body feathers on all the main pteryxae (feather tracts). The bill is now black, with a yellow gape, and the ear patches are darker. Just prior to fledging, from day 23 onwards, the nestling closely resembles the adult in plumage, except for the head coloration. In the case of the White-necked Picathartes, the yellow head skin of the adult is already developed to varying extents at fledging, whereas the adult head colours of the Grey-necked Picathartes seem to be absent at fledging.

Chicks more than three weeks old regularly stand in the nest or climb on the rim to preen or to flap their wings. When about to leave the nest for the first time, young White-necked Picathartes whistle in a characteristic piercing manner, as also do their parents, and the chicks leave by gliding with outstretched wings from the nest rim to the ground, where they are met by an adult, which feeds them with insects before they are led away.

Nestling growth curves are sigmoidal, and body weights increase from about 11–12 g, equal to about 5% of mean adult weights, at hatching to about 150–160 g, approximately 70% of adult values, just before fledging. Other measurements, including those of the wing, the tail and the bill, exhibit a similar pattern, so that body size does not reach that of the adult during the nestling stage, growth being completed after the young leave the nest. The tarsus grows fastest of all and the tail is the slowest-growing, so that tail length at fledging is less than one third that of a mature adult.

Nesting success of White-necked Picathartes, defined as the probability of eggs laid surviving both the incubation and nestling stages, is currently low. Success levels have apparently declined, from 71% in Ghana in the 1960s to 23% in Sierra Leone in the 1990s. This decline over a period of 30 years may have come about as a result of increased disturbance or reduced habitat quality and/or availability. In Sierra Leone, the number of White-necked Picathartes chicks successfully reared per nesting pair in the 1990s was only 0.44. A theoretical predictive life-table model constructed from these data indicates that populations of this species in Sierra Leone could be declining slowly because of natural causes alone. An alternative possibility is that the White-necked Picathartes is very long-lived, with an adult survival rate in excess of 90%, and that there is strong competition for nest-sites, so that populations are self-sustaining so long as adult mortality remains low.

Known causes of nest losses suffered by picathartes are predation, infanticide or cannibalism, competition from intruding conspecifics, and infertile eggs. Predation seems to be the main cause, accounting for 41% of nest-content losses at 22 White-necked Picathartes nests in Sierra Leone. Many nests and their contents are lost or destroyed for unknown reasons. In studies in Sierra Leone, 36% of losses could not be assigned to any known factor with any degree of certainty. Infanticide or conspecific competition caused 14% of losses, while eggs which remained in the nest beyond the estimated maximum incubation period before disappearing were deemed infertile and these accounted for 9% of failures.

Predators of the two species of picathartes are thought to include snakes, such as the spitting cobra (*Naja nigricollis*) and the black-and-white cobra (*Naja melanoleuca*), monitor lizards (*Varanus niloticus*), forest sun-squirrels (*Heliosciurus*), forest

**The White-necked Picathartes** generally breeds in the wet season, perhaps because this is when mud nests are easiest to build, or because this coincides with peak prey abundance. Both parents incubate the eggs for some 20 days, and feed the nestlings for 25–26 days. The nestling diet includes large numbers of forest-floor invertebrates, including earthworms, millipedes, and insects such as grasshoppers and beetles. In terms of biomass, vertebrates such as frogs and lizards make up a major component of the diet.

[*Picathartes gymnocephalus*, Mount Nimba, Liberia. Photo: A. Forbes-Watson/VIREO]



raptors such as the Red-chested Goshawk (*Accipiter toussenelii*), colobine monkeys (*Procolobus*), chimpanzees (*Pan troglodytes*) and human beings. Hunters, young boys and chimpanzees are known to take eggs from nests or to destroy nests; snakes and monitor lizards have been flushed from breeding sites; and squirrels, raptors and monkeys elicit loud alarm calls from breeding pairs. Adult picathartes roosting in nests are sometimes killed by hunters, but this seems for the most part to be incidental. The apparent inaccessibility of most picathartes nests, sited 1.5–2.5 m above ground on largely smooth vertical rock faces, suggests that avian species, probably raptors, are the main predators. Predation by snakes is thought to be rare.

Infanticide by bird species has only rarely been documented, but it seems to be widespread among picathartes, having been recorded since the 1960s for both captive and wild individuals over most of the range of the genus in Gabon, Cameroon and Sierra Leone. In Sierra Leone, adults were observed as they removed eggs and/or chicks from two nests of conspecifics in the absence of the nest-owners, and on one occasion fighting with nest-owners to the extent that the nest was destroyed and the chicks killed. Infanticide has generally been explained as being variously exploitation, resource competition, parental manipulation and sexual selection.

Although picathartes have been described as egg-eaters in captivity, they have not been observed to eat the eggs or young of conspecifics in the wild, such behaviour having been, at best, inferred as occurring in Cameroon. Moreover, breeding pairs in Cameroon and Sierra Leone have been observed to defend their nests against adult conspecifics which were attempting, sometimes successfully, to destroy the contents. These observations indicate that adult picathartes, at least in the wild, do not consume or otherwise use their victims for their own benefit, as they would if exploitation were the correct explanation for the behaviour. Nor did they destroy their own young in order to improve their own chances

of survival or those of other, existing offspring, which they should have done if parental manipulation were the reason.

Thompson has suggested that the birds destroy one another's offspring in order to gain access to suitable breeding sites, which are known to be limited in some parts of their range. This explanation fits with observations which suggest that *Picathartes* is monogamous and that non-breeders or "floaters" occur at some breeding sites. Disturbance by floaters lowers the breeding success of some bird species, and it is possible that picathartes floaters destroy nests and their contents so as to gain access to nesting sites or mates.

## Movements

The two species of *Picathartes* are resident Afrotropical birds that do not undertake long-distance migrations. They were initially thought to stay close to the breeding/roosting sites throughout the year, but investigations in the 1990s suggest that they undertake localized movements over a wide area and make regular use of non-forested habitat, including clearings, farmbrush or forest regrowth, and along man-made tracks, paths and roads. A. Siaka estimated the home-range size of six White-necked Picathartes fitted with radio transmitters as varying from 0.322 km<sup>2</sup> to 3.92 km<sup>2</sup>, with a mean size of 1.36 km<sup>2</sup>; 82.5% of this home-range area comprised forested habitat, while 17.5% was farmbrush.

Very little more is known about the local movements of the picathartes. Because the species breed mainly in forest, and because this rainforest habitat is becoming increasingly fragmented, an essential question in picathartes ecology is that of whether adults and juveniles can disperse across significant chunks of non-forested habitat. This is not yet known, and the answer may well hold one of the keys to the future survival of the genus.





The **White-necked Picathartes** usually lays two eggs, but overall breeding success is apparently low. In Sierra Leone, one study concluded that only 23% of eggs laid produced fledglings and only 0.44 young fledged per pair. The causes of nest failure are many and varied, including infanticide and cannibalism, both of which seem unusually common in *Picathartes*. Nests are also preyed upon by raptors, reptiles and primates (including humans). The low reproductive output of *picathartes* is compounded by low population density and habitat fragmentation in West African forests. Both species are thought to number fewer than 10,000 mature individuals, both are thought to be declining, and both are classed as Vulnerable.

[*Picathartes gymnocephalus*,  
Ziama forest, Guinea.  
Photos: Dominique Halleux/  
Bios]

### Relationship with Man

In the past, *Picathartes* has had totemic value in parts of its range. In the south and east of Sierra Leone, for example, the imposing and sometimes bizarre-looking rock formations on which the White-necked Picathartes build their nests were once thought to house ancestral spirits, and the birds themselves were considered guardians of these ancestral homes. Although these beliefs are now largely extinct, a residual fascination with the birds has persisted, and local people are often reluctant to molest them or to destroy their nests. On the other hand, the inaccessibility of the terrain in which these species are usually found, coupled with their normally shy behaviour, has meant that their presence is often unknown to the vast majority of local human populations in areas where they exist.

Hunters and trappers are known to take eggs and young opportunistically, but almost certainly at very low levels when left to their own devices. In the 1950s and 1960s, however, demand from western zoos and bird-keepers fuelled a demand for live picathartes that almost certainly contributed to the recorded population reductions in the wild (see Status and Conservation). Thankfully, this trade has now largely died down.

Since the 1990s, *Picathartes* has become an iconic symbol and flagship taxon for conservation and eco-tourism in West Africa, holding an enduring interest for birdwatchers, tourists and scientific researchers because of its striking appearance, its strange habits and its rarity.

### Status and Conservation

Both species of picathartes are classified as Vulnerable under the IUCN/BirdLife threat criteria. The global population of each is thought to number fewer than 10,000 mature individuals, and it is likely that there will be a continuing decline in numbers of mature individuals of at least 10% within ten years. The Grey-necked Picathartes is almost certainly more common and more widely distributed than the White-necked Picathartes, and there is support from some ornithologists for its threat status to be downgraded from Vulnerable to Near-threatened.

In recent systematic problem analyses by Thompson and co-workers, in 2004, and Bian and colleagues, in 2006, it was determined that the current low estimated populations of picathartes stem from a reduction in the extent and/or quality of the species' preferred rainforest habitat, from declining population trends, from lack of knowledge of the species' distribution and numbers, and from naturally low population densities. Habitat destruction, particularly deforestation, and habitat fragmentation and degradation are the main reasons for the decline in the area of suitable habitat and the recurrent trend of declining population estimates. The proximal causes of the destruction and degradation of rainforest across the species' ranges in West and west-central Africa are numerous and complex, but are almost invariably related to unsustainable and poorly planned human-related developments. These include intensified and unplanned agricultural expansion for increasing human populations and settlement expansions, which in turn result in increased demands for energy, income, food and other human needs. These needs result in practices that have a negative impact on picathartes' habitats, such activities including: forest clearance for food cultivation; fuel-wood extraction; illegal logging; commercial logging; wood-cutting for poles; charcoal production; and so on. Natural disasters such as wildfires and landslides may also play a role in the reduction in the area of natural habitat available to the species.

Picathartes seem also to occur in naturally low population densities, and there is a lack of knowledge of their distribution and abundance in some parts of their ranges. It is now recognized that the inaccessibility of some of the breeding sites of the species, insufficient inventories, and inadequate research stemming from limited trained personnel and funds may be leading to underestimates of the species' true numbers and to estimates of declining population trend. Furthermore, some aspects of the breeding biology and ecology of picathartes may be promoting

the impression of "natural rarity". These include stringent physical parameters for breeding sites, resulting in shortages in suitable sites and competition for nest-sites, which lead to fighting among adults, infanticide, and egg and nest destruction (see Breeding). Incidental hunting and trapping may have contributed to the decline in population levels, and offtake for the cagebird trade perhaps had a somewhat more serious impact. This trade, however, is now mainly obsolete, because of greater awareness among local human inhabitants, stricter law enforcement and changing ethical perspectives.

Both picathartes species are listed in Appendix I of CITES and both are protected by national legislation in some parts of their ranges. The White-necked Picathartes receives legal protection in Sierra Leone, Liberia and Ghana and the Grey-necked Picathartes in Cameroon.

Various recommendations have been made for the conservation and management of the two picathartes, and "Species Action Plans" have been developed, by Thompson and colleagues for the White-necked Picathartes and by Bian and colleagues for the Grey-necked Picathartes, in an attempt to improve the conservation status of each one. The plans aim to stabilize or increase the populations of the two species in key range states within five years. In order to achieve these aims, a number of specific objectives and strategies are set out, of which the priorities are to ensure that realistic estimates of population size and distribution are available, that unsustainable human-related development and activities at major breeding strongholds are reduced measurably, and that local capacity for the study and conservation of the species is reinforced.

Under the aegis of BirdLife International, "International Species Interest Groups" have been formed to implement, and to monitor the effectiveness of, these action plans for the picathartes. The groups are co-ordinated both regionally and at national level. The plans were developed through a highly participatory process involving national and international experts, as well as government representatives, students and other interested parties, thus providing a training opportunity, and facilitating the formation of conservation networks and the incorporation of the plans into general national biodiversity-conservation frameworks.

The success of these Species Action Plans will depend on their being rapidly implemented and regularly reviewed. At the time of going to press, in mid-2007, components of the plans were being implemented by BirdLife partners in Sierra Leone, to protect breeding sites of the White-necked Picathartes in the Western Area Peninsula Forest; in Ghana, to update estimates of the national population size and distribution of that species; and in Cameroon, to safeguard breeding sites of the Grey-necked Picathartes at Mbam-Minkom, close to the capital city of Yaoundé. These are promising signs but, in the long run, the continued survival of picathartes populations in West and Central Africa will depend on the continued existence and holistic proper management of the Guineo-Congolian forest belt in which these two fascinating species occur.

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PLATE 1

Genus *PICATHARTES* Lesson, 1828

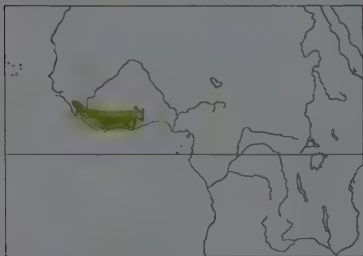
1. White-necked Picathartes

*Picathartes gymnocephalus*

**French:** Picatharte de Guinée **German:** Gelbkopf-Felshüpfer **Spanish:** Picatartes Cuelliblanco  
**Other common names:** White-necked/Bare-headed Rockfowl, Yellow-headed Picathartes/Rockfowl

**Taxonomy.** *Corvus gymnocephalus* Temminck, 1825, Guinea coast.  
 Taxonomic position of genus subject to ongoing debate. Now generally considered to represent a monotypic family, related to “thrush-babbler assemblage” of the Timaliidae; has been suggested that closest relatives are the rockjumpers (*Chaetops*) of South Africa. May form a superspecies with *P. oreas*. Monotypic.

**Distribution.** Forest belt in S & E Guinea, Sierra Leone, Liberia, Ivory Coast and Ghana.



**Descriptive notes.** 33–38 cm; 192–254 g. Large unusual-looking passerine with fairly long and broad tail, large curved bill, strong and muscular legs. Most of head and nape are bare, with yellow skin, sharply contrasting black patch on rear side of head; upperparts, including wing and tail, mainly dark slaty to blackish with brown tinge (brownest in mantle region and tail); soft grey down feathers below contour feathers sometimes give upper surfaces a silvery sheen; white below, feathers tinged with pale lemon-yellow, grading into pale yellow on throat and upper belly; iris brown, pupil blue-black; bill black; legs sil-

ver-grey. Sexes alike. Juvenile resembles adult, except for dark smudges on yellow skin of head. **Voice.** Mostly silent; has loud, harsh “aaoww” alarm call and melodious whistling contact call; persistent churring or grunting at roost gatherings.

**Habitat.** Primary or secondary forest in hilly, rocky terrain, usually close to running water; survives also in disturbed habitats, such as forest clearings, farmbrush and secondary growth, and in some cases close to human activity.

**Food and Feeding.** Food mainly forest floor-invertebrates, including insects, earthworms (Oligochaeta) and spiders (Araneae); beetles (Coleoptera), termites (Isoptera), ants (Hymenoptera) and grasshoppers (Orthoptera) the most frequently taken insects. Also eats vertebrates (frogs and lizards), and these constitute most of food biomass fed to nestlings. Forages singly, in pairs or in small groups on forest floor and on low vegetation not more than 1 m high; progression usually by bounding hops, and sustained flight rare. Uses large strong bill to turn over leaves. Frequently follows columns of army ants (Dorylinae) to capture prey flushed by the insects.

**Breeding.** Generally coincides with wet season, with egg-laying in Jun–Dec (peak numbers in Oct) and nestlings present Aug–Jan (highest numbers in Nov), with some regional variation; apparent laying in dry season in some parts of range, e.g. Dec and Mar in Liberia (Mt Nimba), possibly due to high elevation of site. Breeds in pairs (contrary to early suggestions of co-operative breeding), and defends nest vigorously, sometimes some vicious fights occurring. Nests singly or in small colonies of up to ten nests (only one or two nests at most sites). Cup-shaped mud nest built on rock face, cliff or cave roof; internal cup size varies markedly, average 10·8 × 17·2 × 12·9 cm.

Family PICATHARTIDAE (PICATHARTES)  
 SPECIES ACCOUNTS

Clutch usually 2 eggs; incubation by both parents, taking turns, median incubation period c. 20 days; chicks fed by both sexes, nestling period generally 25–26 days (extremes 23 and 29 days). Success apparently low, in Sierra Leone only 23% of eggs laid produced fledglings and only 0·44 young fledged per pair; known causes of failure are predation (including by humans), infanticide and cannibalism, competition from intruding conspecifics, and infertile eggs.

**Movements.** Resident; may range over several kilometres, but probably stays close to breeding sites/roosts all year.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Upper Guinea Forests EBA. CITES I. Populations fragmented, patchy and localized. Generally rare but widespread, and not uncommon in parts of its range. Mean range size 1·36 km<sup>2</sup> in Sierra Leone. Considered to have suffered, or is likely to suffer, a 20% population decline in ten years, or during course of three generations. Global population estimated at 2500–9999 individuals within geographical range of 391,000 km<sup>2</sup>. Decreasing population estimates due largely to declines in extent and quality of habitat. Protected by national legislation in most countries of its range. In Guinea, rare to common and widespread in S (from SW to SE) but unrecorded in N; current known localities are Grandes Chutes and Kounoukan (in Kindia province), Massif du Ziama, Mt Nimba and Diecke (in Nzerekore), and Mont Béro Forest Reserve (N of Nzerekore). Sierra Leone population estimated at c. 1500 birds, with bulk of these in Gola Forest in SE; rare but widespread throughout rest of country except in N, with known colonies in Western Area Peninsula Forest, Kambui Hills, Kangari Hills, Dodo Hills, Loma Mts and Nimini Hills. In Liberia rare to not uncommon, numbers increasing from coast to interior (most records from N highlands), and population estimated at 1000–2000 individuals; known breeding colonies in NW & W in Wologizi Mts and Wonegizi Mts, and Lofa-Mano (Lofa/Grand Cape Mount), and in N & E at Mt Nimba, Zwedru and Sapo. In Ivory Coast very local but not uncommon, with “best-guess” population estimate of 1500 individuals; occurs in W & S, at Mount Sangbé National Park, Nimba Nature Reserve, Mont Péko National Park, Lamto Research Station, and Taï Forest National Park, also at Geioule, Mt Glo, Mon Momi and Sangouni. Now uncommon and much localized in Ghana, with historical records confined to S third of country at Fumso (Central Region), Adumoa, Mpraeso (Ashanti Region) and Kwahu-Tafo, Abeti, Bekwai, Kumasi and Akwapim Hills (Eastern Region); until recent rediscoveries, in 2003, the species had not been seen in Ghana since 1960s; the most recent records are from Goaso (Eastern Region) and Asumura (Brong-Ahafo Region).

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2. Grey-necked Picathartes

*Picathartes oreas*

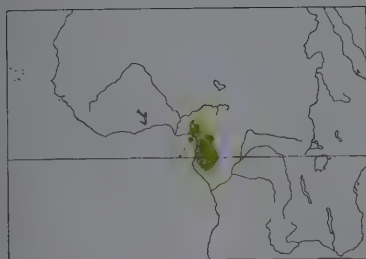
**French:** Picatharte du Cameroun **German:** Buntkopf-Felshüpfer **Spanish:** Picatartes Cuelligris  
**Other common names:** Grey-necked Rockfowl, Red-headed Picathartes/Rockfowl

**Taxonomy.** *Picathartes oreas* Reichenow, 1899, Victoria, Cameroon.

Taxonomic position of genus subject to ongoing debate. Now generally considered to represent a monotypic family, related to “thrush-babbler assemblage” of the Timaliidae; has been suggested that closest relatives are the rockjumpers (*Chaetops*) of South Africa. May form a superspecies with *P. gymnocephalus*. Monotypic.

**Distribution.** Equatorial forest belt in SE Nigeria, W & S Cameroon, Equatorial Guinea including Bioko I (Fernando Póo), Gabon and SW PR Congo.

**Descriptive notes.** 33–38 cm; 200–250 g. Large odd-looking passerine with fairly long broad tail, long curved bill, and strong legs. Has bare head, with skin of forecrown lilac-blue to powder-



blue (this colour extending to proximal part of upper mandible, to above nostril), that of hindcrown and nape red (carmine or crimson), and triangular area of black skin on side of head (lores, cheek and ear region), with black band across crown between blue forecrown and carmine hindcrown; upperparts and tail dark bluish-grey, primaries and their coverts black (forming very distinctive band separating slaty back from yellowish vent); neck and throat to upper breast washed grey, rest of underparts soft lemon-yellow to light yellowish-buff; iris dark brown; bill black; legs grey. Sexes alike. Juvenile resembles adult, but head

colours seem to be absent at fledging. **VOICE.** Mostly silent, but sometimes gives low, quiet drawn-out rasping or hissing "wheet" call, 1–2 seconds long, repeated several times every c. 4 seconds, has been likened to sound of "heavy furniture being pushed across a gritty wooden floor"; single or double "peep" when approaching nest with food; on arrival at nest, utters regularly repeated low "ga-a-a".

**Habitat.** Rainforest; almost always encountered in primary or secondary forest, but may have greater tolerance of degraded habitat than previously believed. In Cameroon, associated with caves, cliffs and overhanging rocks in rugged and inaccessible places. Mainly in lowlands, but in Cameroon at up to 1800 m on Mt Cameroon and 2100 m on Mt Kupé; 250–900 m on Bioko.

**Food and Feeding.** Food mainly forest-floor invertebrates, including grasshoppers (Orthoptera), beetles (Coleoptera), earwigs (Dermaptera), ants (Hymenoptera), crabs (Decapoda), earthworms (Oligochaeta), slugs and snails (Gastropoda); also small vertebrates, primarily frogs and lizards, but in Nigeria fish found in crops of individuals caught near a river. Some vegetable matter also consumed. In one study, wide variety of insects found in crops of individuals, also fruits and flower buds, but animal food constituted majority of items. Forages singly, in pairs or in small groups on forest floor and on low vegetation, locally perhaps also at higher levels; progression mostly in bounding hops. Uses large strong bill to turn over leaves. Occasionally hunts among bat guano in caves. A strong follower of army-ant (Dorylinae) columns in forest. Rather inactive during midday hours; in Gabon, roosts in nest around midday and resumes foraging in afternoon.

**Breeding.** Associated with wet season, nesting twice yearly where rainfall distribution bimodal; nesting activity recorded Mar–Nov (peak between Aug–Nov) in Cameroon, and season given as Aug–Nov in Nigeria and Nov–Apr in Gabon. Apparently monogamous. Breeds singly or, where nest-sites limited, colonially, majority of colonies containing 2–5 nests. Nest built by both partners equally, a cup-shaped hard stone-like structure constructed from mud intermixed with rootlets and vegetable fibres, typical measurements 40 cm long, 29 cm wide and 14 cm thick (but considerable variation), usually built on rocks, cliff or cave roof. Clutch 1–3 eggs, usually 2 (mean 2.3); incubation period 21–24 days; nestling period c. 24 days. Many nests seem to be destroyed for reasons unknown, but current evidence points to cannibalism and predation as main causes of nest losses; predation by snakes thought to be rare, but chimpanzees (*Pan troglodytes*) known to destroy nests with eggs, and human hunters sometimes kill the adult birds.

**Movements.** Resident; probably stays close to breeding sites/roosts all year.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Cameroon and Gabon Lowlands EBA and Cameroon Mountains EBA. CITES I. Although overall range is relatively large (314,000 km<sup>2</sup>), population is highly fragmented, and considered to number fewer than 10,000 mature individuals; may be in overall decline, but new colonies are being found and numbers may yet prove to exceed the threshold for its current threatened status. Hunting and trapping are prohibited in Cameroon, but the species is apparently unprotected in all other range states. In Nigeria, known from total of c. 136 sites in SE, almost all in forests of Cross River State; locally common in undisturbed forest close to Cameroon border. In Cameroon, widespread in S & SW, mainly in coastal lowland rainforest; colony with 47 nests in Dja Biosphere Reserve may be the largest one known. On Bioko, limited to almost inaccessible terrain in SW (Gran Caldera de Luba and a 7-km stretch of R Olé at 250–900 m), where ten sightings reported in late 1980s; apparently some old records from mainland NW Equatorial Guinea. Most records from Gabon are from C & NE of the country, but in 2000 this species was discovered in SW (on Mt Doudo), representing a considerable range extension to the S. In Dec 1994, recorded for the first time in PRCongo, where one observed in relatively undisturbed forest in SW, c. 300 km from Gabon border (details of record not published until 2006); earlier reports that this species' range extends E to NE PRCongo apparently unfounded.

**Bibliography.** Adeyemo & Ayodele (2005), Anon. (2006j), Ash (1991), Bian *et al.* (2006), Borrow & Demyer (2001), Brosset (1965), Butchart & Stattersfield (2004), Butynski & Koster (1989), Butynski *et al.* (1996), Collar & Stuart (1985), Fry *et al.* (2000), Hall, B.P. & Moreau (1962, 1970), Hall, J.B. (1981), Mamonekene & Bokandza-Paco (2006), Moore (1974), Sibley & Ahlquist (1990), Sibley *et al.* (1988), Stattersfield & Capper (2000), Thompson (2003), Thompson & Fotso (1995), Tye (1987).



Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family TIMALIIDAE (BABBLERS)**



- Tiny to rather large passerines, highly variable, most with short and rounded wings, usually relatively long tail often graduated, generally rather robust but not very deep bill, sturdy legs; plumage widely variable, many species rather plain and some dull brown, others strikingly patterned in contrasting and/or bright colours.
- 7–35 cm.



- Asia and Africa; one species in western North America.
- Forest, forest edge, scrub and grassland, from desert fringes to deep rainforest.
- 84 genera, 309 species, 872 taxa.
- 28 species threatened; none extinct since 1600.

### Systematics

For many years, the babblers were regarded as forming a subfamily within a greatly enlarged family Muscicapidae, but the distinctiveness of many species rendered this arrangement somewhat unsatisfactory, and resistance to the idea increased in the last quarter of the twentieth century. Indeed, opinions among taxonomists have not always been uniform even on the point of the babblers' proximity to the great thrush–chat–flycatcher–warbler assemblage, and the possibility that there could, in fact, be a closer affinity to the crows (Corvidae) and their allies was entertained into the 1960s.

Typical features of timaliids are plumage similarity of the sexes, largely adult-like juveniles lacking the general spotting characteristic of thrushes and chats (Turdidae), and short, rounded wings, a tendency towards a longer, rounded tail, generally a stout bill and legs, often soft, slightly lax body plumage, sometimes notably fluffier on the rump, and often a pale or reddish eye. Additional characteristics, relating to behaviour, are that the babblers usually practise direct head-scratching, often roost socially in a tight huddle along a branch, indulge in allopreening, and employ the foot in feeding, the last being a character which, indeed, allies them with the crows, the shrikes (Laniidae), the tits (Paridae) and the drongos (Dicruridae). Nevertheless, these are not the most robust or decisive of characteristics by which to identify a species as belonging within or outside the family, and it is a long-standing source of amusement among taxonomists and systematists that the family Timaliidae represents a “dust-bin” into which have been dropped all those taxa the affinities of which have been uncertain to these scientists or their predecessors; in 1896, Alfred Newton called the family both “a refuge for the destitute” and a “festering mass”. In recent years, however, biomolecular studies, particularly those led by A. Cibois, have been demonstrating the degrees of truth behind the joke. Unfortunately, as those studies are still in progress, we are not yet at the stage where it is appropriate to offer a major revision of the family as currently constituted, one that would reflect what is known so far. In the present arrangement, therefore, a number of species are included that are certainly not babblers, but which need to be retained in the Timaliidae for the moment while, among other things, scientists endeavour to clarify their true taxonomic positions. It is a frustrating circumstance, made all the more so by the knowledge that some groups of birds which are not presently included in the Timaliidae actually *are* babblers.

Among the latter, most awkwardly, the genera *Sylvia*, which is the type genus of the warbler family Sylviidae, and *Parisoma*, for which the English name “tit-babbler” was often used until it was considered instead a warbler, appear indeed to be timaliids, as do the parrotbills (Paradoxornithidae), the white-eyes (Zosteropidae) and at least one member of the sylviid subfamily Megalurinae, namely the Rufous-rumped Grassbird (*Graminicola bengalensis*). The biomolecular studies indicate that, intriguingly, the anomalous Bearded Parrotbill (*Panurus biarmicus*), which, with its pale eye, colourful wing pattern, graduated tail and social habit, looks and behaves so much like a babbler, has nothing to do with the parrotbills, but suspicions persist that it may eventually prove to be a babbler, having diverged as a result of a relatively rapid breeding rate. The discovery about the affinities of *Sylvia* is particularly unfortunate, because the family name Sylviidae precedes the family name Timaliidae by seven years,



*The babblers, one of the most diverse families of birds, are generally characterized by dull plumage and sexual monomorphism.*

*The Rufous-tailed Babbler is no exception to this rule. Placed in the monospecific genus Moupinia, it occurs in grass, thickets and scrub from north-west Yunnan to north Sichuan, China. It has a strongly curved culmen and a rufescent tone to the wings and tail, two features that are widespread in the family.*

[*Moupinia poecilotis*, Jizushan, Yunnan, China. Photo: John & Jemi Holmes]

One of the most significant discoveries arising from the recent spate of phylogenetic analyses is that the *Wren-tit* is a babbler, and therefore the sole New World member of *Timaliidae*. Previously thought to be an aberrant parid tit, it is genetically allied to *Sylvia* warblers (now also found to be babblers). This relationship is not entirely surprising given the shared characteristics between *Chamaea* and many *Sylvia*, including pale irides, general structure and habitat. The *Wren-tit* occurs in brush, scrub and dry forest in the states of Oregon and California, USA.

[*Chamaea fasciata henshawi*,  
Malibu, California, USA.  
Photo: Joe Fuhrman/  
VIREO]



so that, technically, the name "Sylviidae" now stands for all species related to *Sylvia*; consequently, the babblers as we have known them for the best part of 200 years would have to transfer to an entirely newly constituted "Sylviidae". The situation is currently under consideration by the authorities, but the preferred option appears to be to incorporate the genus *Sylvia* into the existing *Timaliidae*, to keep the latter name and to suppress the name "Sylviidae", since this last family is, in any case, likewise starting to come apart under the remorseless unpickings of modern DNA work.

Species that are not babblers, and which are not included in the family as treated here, are the group known as the "Australasian babblers", sometimes called the "pseudo-babblers", and all except one of the "Malagasy babblers". As the biomolecular work by C. G. Sibley and J. E. Ahlquist indicated, the Australasian babblers are corvidan in affinities, and they occupy a family of their own, Pomatostomidae. In the case of the Malagasy group, the genera *Neomixis*, *Hartertula*, *Thamnornis*, *Oxylabes* and *Crossleyia* are now understood to be of "sylvine" (in the old sense) ancestry, with the first two assigned to the Cisticolidae and the second three to the Sylviidae. The remaining Malagasy genus, *Mystacornis*, although currently included in the *Timaliidae*, seems not to be a true babbler, although its affinities are not known. Ironically, M. P. S. Irwin, in his review of these birds, reserved his greatest doubts for *Mystacornis* as a babbler, but he was right in recognizing its clear difference from the other genera, and its appearance certainly makes it improbable that it is a timaliid species. Another "non-babbler" is the Sundaic endemic the Rail-babbler (*Eupetes macrocerus*). Previously placed in *Timaliidae*, this forest-dwelling species was reassigned to the Australasian babblers and, more recently, included with the *Ptilorrhoa* jewel-babblers and the related genera *Androphobus* and *Psophodes*, in fact becoming the type species for the family, Eupetidae, that embraces these genera. Now, new research indicates that *Eupetes* is not related to *Ptilorrhoa* at all but, rather, and surprisingly, to the South African genus *Chaetops*. The story twists further, because *Chaetops* is included in the present treatment of *Timaliidae*, even though it is not a true babbler.

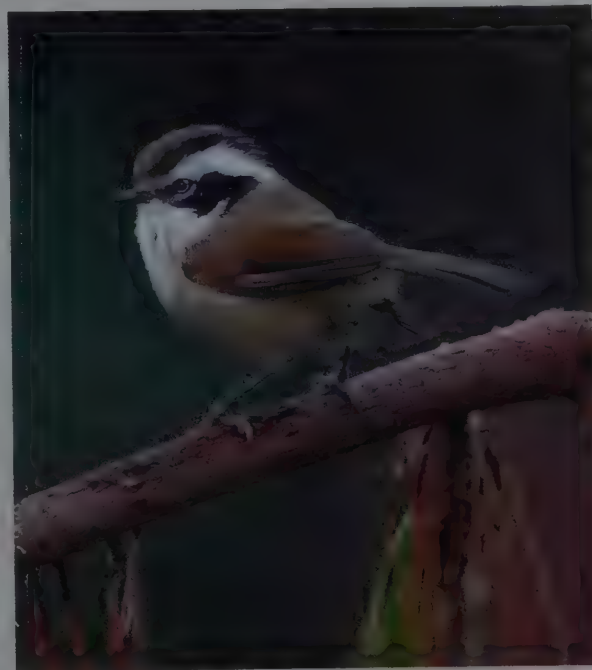
Also apparently outside the family, despite their current inclusion within it, are the *Pteruthius* shrike-babblers and the species commonly named in the literature as the "White-bellied Yuhina", the White-bellied Erpornis (*Erpornis zantholeuca*). Independent work by Cibois and by S. Reddy indicates that these belong in the Corvoidea. Indeed, they are close to the vireos

(Vireonidae) of the New World, and it is now recommended that they be treated within that family. Several birdwatchers and ornithologists can congratulate themselves on having described the shrike-babblers as being vireo-like, biogeographically improbable as the connection may have seemed.

Other species close to the White-bellied Erpornis in the present arrangement either are not babblers, or not proven to be such, or have only recently been shown to be babblers. The position of the Chinese Bush-dweller (*Rhopophilus pekinensis*) has long been uncertain. This exhibits certain warbler-like traits and no very strong affinities to babblers, but J. D. La Touche, in the 1930s, observed that "on the whole, it is more of a Babbler than a Warbler" and "like the Babblers it is a good cage-bird, becoming very tame and docile"; very recently, DNA analyses appear to corroborate his view, the species showing links to both *Sylvia* and *Paradoxornis* and probably needing to be placed near the top of the sequence, perhaps somewhere between *Chrysomma*

The genus *Fulvetta* has been resurrected to address the polyphyly of *Alcippe*. It now contains eight species of evergreen forests in continental South-east Asia, each of them with a simple song, short rectal bristles and a long hind claw. This last feature is an adaptation, as these tit-like species often hang upside-down when foraging. All members of the genus, including the *White-browed Fulvetta*, have contrasting panels or flashes on the folded remiges.

[*Fulvetta vinipectus bieti*,  
Gangshan, Dali,  
Yunnan, China.  
Photo: John & Jemi  
Holmes]







and *Chamaea*. Similarly, the Bush Blackcap (*Lioptilus nigricapillus*), so odd that it has even been suggested that it could be a bulbul (Pycnonotidae), turns out to be close to *Sylvia* and might therefore be placed at the very head of the sequence, with *Pseudoalcippe*. The Juniper Babbler (*Parophasma galinieri*), usually known as the "Abyssinian Babbler" or "Abyssinian Catbird", is of as yet uncertain affinities. Another odd African isolate, the Principe Flycatcher-babbler (*Horizorhinus dohrni*), seems unlikely to be a timaliid, if only because the family demonstrates a congenital inability to cross big stretches of water, and it could just as easily be given the name of "bulbul-chat" or "thrush-warbler" as the one by which it passes here. Even so, it

was placed with the babblers because of the narrowing of the middle of the bill, as in the genus *Illadopsis*, and its voice resembles those of *Kupeornis* and *Ptyrticus*, the latter now known to be close to *Illadopsis*, so that the Principe Flycatcher-babbler may yet prove to be a valid member of the Timaliidae. Equally uncertain is Asia's Fire-tailed Myzornis (*Myzornis pyrrhura*), which has certain patterns in the wing which are reminiscent of some of the more colourful babblers and a bill and tongue similar to those of the *Malacias* sibilas, but it is different in structure, and may well have its roots elsewhere. So, too, may the *Malia* (*Malia grata*), a huge, strangely patternless bird by babbler standards, and one thought by C. M. N. White to be possibly a bulbul. *Malia* is part of an anomalous group of monotypic Sulawesi genera that are in great need of molecular analysis in order to determine their placement; the most obvious other candidates for such research are *Geomalina* and *Cataponera*, both of which have been treated as babblers in the recent past.

Meanwhile, molecular studies have shed enough light on the Grey-chested Kakamega (*Kakamega poliothorax*), the Spot-throat (*Modulatrix stictigula*) and the Dapple-throat (*Arcanator orostruthus*) to indicate that these belong, not with the babblers, but near the sugarbirds (Promeropidae) of southern Africa. In another delightful surprise, one that nobody would have been likely to credit without genetic evidence, the rockjumpers (*Chaetops*) of South Africa, long proposed as babblers because of the lax, fluffy plumage on their flanks, belly, lower back and, particularly, rump, turn out to be related to the two picathartes (Picathartidae) of West Africa, but are sufficiently distinct in structure, behaviour and breeding biology to be worthy of their own separate family, Chaetopidae. The Rockrunner (*Achaetops pycnopygius*), which shares the rather lax lower-body plumage of *Chaetops*, has endured a long, unhappy association with that genus, and even been treated as part of it, but in reality it is a somewhat different bird, moving in a mouse-like run, rather than a bold hop or jump; whether it has timaliid roots remains to be seen. The final species, the Madagascar Groundhunter (*Mystacornis crossleyi*), has already been mentioned; the only reason why it was ever mooted as a babbler appears to be its terrestrial habits. Incidentally, it has sometimes been thought that the Philippine creepers (Rhabdornithidae) might be babblers, and

Eight distinctive crested species of continental South-east Asia and Taiwan are placed in the genus *Yuhina*. They all have very slightly decurved and relatively pointed bills, with well-developed rictal bristles. The tail is short and square; the plumage is muted in greys, browns and whites; and the entire aspect is somewhat like a titmouse (*Baeolophus*). The **Whiskered Yuhina**, like its near relatives, is an active, group-living, flock-following species of humid evergreen forest edges.

[*Yuhina flavicollis rouxi*, Doi Lang, Chiang Mai, Thailand.

Photo: Kanit Khanikul]



The **Black-crowned Babbler** has traditionally been placed in the genus *Stachyris*, but it now joins four other Philippine species in *Sterrhoptilus*. These forest-dwelling forms have slender, pointed bills with moderate-length rictal bristles, streaked upperparts, and stiffened glossy crown feathers. The genus might need further subdivision as two members, the "pygmy babblers", are distinctive in their tiny size, their plumage pattern and the proportionately shorter bill.

[*Sterrhoptilus nigrocapitatus affinis*, Mt Maquilang, Luzon, Philippines.  
Photo: Doug Wechsler/  
VIREO]

Another group of Philippine species usually subsumed into *Stachyris* are now placed in *Zosterornis*. These five species, illustrated by the **Luzon Striped Babbler**, have relatively slender and pointed bills, with shorter rectal bristles than those of *Sterrhoptilus*. All but one has bold ventral streaking. The resurrection of endemic genera reinforces the impression that Philippine babblers are an ancient and highly divergent radiation.

[*Zosterornis striatus*,  
Mt Dos Cuernos,  
Luzon, Philippines.

Photo: Robert Hutchinson/  
Birdtour Asia]



it is interesting that, according to a recent observation, these two species head-scratch by the direct method, moving the foot under the wing, a behavioural trait unusual in passerines other than the babblers. The Philippine creepers, however, are such distinctive birds that it seems appropriate that they be accorded treatment as a separate family, at least until further DNA studies can illuminate their affinities. It has recently been proposed, on the basis of molecular evidence, that they belong, in fact, in the starling family (Sturnidae).

In a pioneering review which dominated the systematic treatment of the babblers for forty years, J. Delacour, who for the then enormous genus *Garrulax* depended largely on the insights

and ideas of his fellow countryman J. Berlioz, published 20 years earlier, arranged the Timaliidae into six tribes with 47 genera and 252 species. These were the "jungle babblers", tribe Pellorneini, with five genera (*Pellorneum*, *Leonardina*, *Malacocincla*, *Ptyrticus* and *Malacopteron*); the scimitar-babblers and wren-babblers, Pomatorhinini, with eleven genera (*Pomatostomus*, *Pomatorhinus*, *Xiphirhynchus*, *Jabouillea*, *Rimator*, *Ptilocichla*, *Kenopia*, *Napothera*, *Pnoepyga*, *Spelaornis* and *Sphenocichla*); the tit-babblers, Timaliini, with six genera (*Neomixis*, *Stachyris*, *Dumetia*, *Rhopocichla*, *Macronus* and *Timalia*); the wren-tit and parrotbills, Chamaeini, with five genera (*Chrysomma*, *Chamaea*, *Panurus*, *Conostoma* and *Paradoxornis*); the "song-babblers", Turdoidini, containing 18 genera (*Turdoides*, *Babax*, *Garrulax*, *Liocichla*, *Leiothrix*, *Myzornis*, *Cutia*, *Pteruthius*, *Gampsorhynchus*, *Actinodura*, *Haplopteron*, *Minla*, *Yuhina*, *Alcippe*, *Lioptilus*, *Phyllanthus*, *Crocias* and *Heterophasia*); and, finally, the tribe Picathartini, with the one genus *Picathartes*. Subsequent work by C. F. Mann, however, countered this. Mann studied the plantar surface of the foot, and his findings, apart from eliminating *Picathartes* as a babbler and providing poor evidence for *Kakamega*, *Mystacornis* and, intriguingly, *Pnoepyga*, being members, entirely failed to support any of Delacour's tribal arrangements.

An interesting but neglected revision of the babblers was furnished by H. Wolters in the 1980s. This redistributed the species into several families, not necessarily regarded as being most closely related to one another. Into the family Illadopsidae, the "mouse-babblers" or *Maustimalien*, went the African genera *Modulatrix*, *Kakamega*, *Ptyrticus*, *Illadopsis* and *Amaurocichla*, the last-named currently treated in the Sylviidae, and the Asian genera *Leonardina*, *Malacopteron*, *Trichastoma*, *Pellorneum* and *Malia* along with two more sylviids, namely *Oxylabes* and *Crossleyia*. Into the next family in sequence, Yuhinidae, the "tit-babblers" or *Meisentalien*, went the genera *Yuhina*, *Staphida* (= *Stachyris castaniceps sensu lato*) and *Erpornis*. Then, several families farther in sequence, came the true babblers, Timaliidae. Wolters was a notable "splitter" of genera, and he led a revival of the subgenus concept, so that this large family is full of unfamiliar names, although in many instances his perceptions have been vindicated by the DNA work that has superseded his general ar-



Seven similar species, often known as "nun-babblers", are placed in the genus *Alcippe*. The **Mountain Fulvetta** typifies this group in being rather uniform in appearance, with pale underparts, plain brown upperparts, and a grey head with dark lateral crown stripes. The culmen is curved and the tail slightly graduated, and roughly equal in length to the wing. The "nun-babblers" are rather common, obtrusive birds. They travel with mixed-species foraging flocks, vocalizing frequently, in the middle storey and at the edges of forests.

[*Alcippe peracensis*  
*peracensis*,  
Fraser's Hill, Malaysia.  
Photo: Teo Nam Siang]



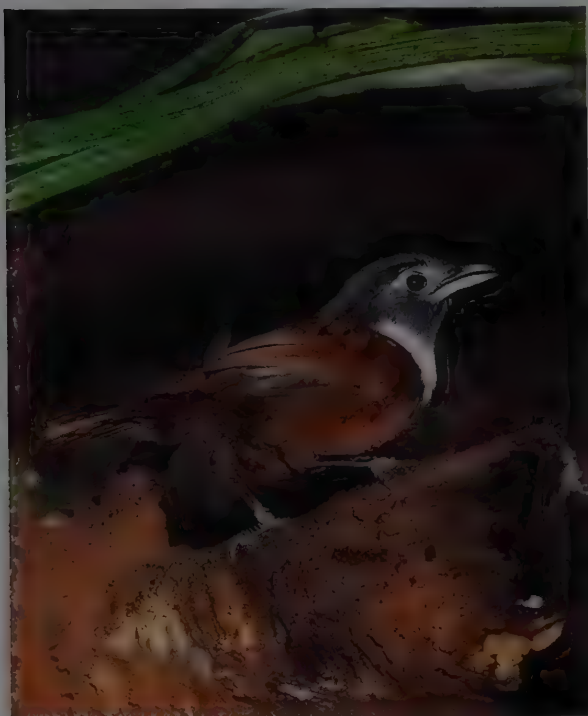


The genus *Schoeniparus* contains three attractive species from continental South and South-east Asia. Previously subsumed into *Alcippe*, they are notable for their weaker bills, stronger feet, and longer hind claws. They also have beautifully striking head patterns, as demonstrated by this **Rufous-throated Fulvetta**. Unlike *Alcippe*, they tend to live in pairs or small groups low down in thick understorey, and rarely join mixed-species flocks.

[*Schoeniparus rufogularis* major,  
Na Haew National Park,  
Thailand.  
Photo: Kanit Khanikul]

rangement. In particular, his willingness to break down the monumental genus *Garrulax* into many constituent genera is a precedent readily followed in the current treatment in light of the molecular evidence of its polyphyly.

In 1990, the results of Sibley and Ahlquist's studies of DNA-DNA hybridization indicated that *Pomatostomus* and *Picathartes* did not belong with the babblers. In addition, these workers were the first to show the close affinities between the Wren-tit (*Chamaea fasciata*), originally thought, as its English name reflects, to be an aberrant parid tit, and the *Sylvia* warblers, something that subsequent molecular investigation has fully corroborated.



Studies by Cibois have taken the rearrangement of the babblers a great step farther, but reduced to rubble the tribal structure proposed by Delacour and found wanting by Mann. According to her findings, "*Yuhina zantholeuca*" is neither a yuhina nor even a babbler, *Kakamega* is not a babbler, and the *Pteruthius* shrike-babblers also belong elsewhere. The remainder of her sample, however, a total of 58 species in 28 genera, formed a monophyletic group that also includes *Sylvia* and *Zosterops*, the "true" *Yuhina* being very close to the latter, and involves several important repositionings and revivals of genera. *Pseudoalcippe* was found to be near *Sylvia*, and not with *Illadopsis* or *Alcippe*, both of which had been mooted previously as its close relations. *Alcippe* itself appeared to be polyphyletic, requiring the reinstatement of the genera *Fulvetta* and *Pseudominla*. The Philippine "tree-babblers", as *Stachyris* babblers are often called, proved to be closer to *Yuhina* than to other *Stachyris*, requiring the reinstatement of some older generic names, and even continental *Stachyris* did not form a monophyletic group. In Cibois's analyses, several species in Delacour's tribes Pomatorhinini and Timaliini turned out to form a clade, and the Pomatorhinini proved polyphyletic because the scimitar-babblers (*Pomatorhinus*) are not the sister-group of the wren-babblers (eight genera). Moreover, the wren-babblers in Delacour's arrangement are themselves polyphyletic, their similarities, which have perhaps been too readily presumed in the past, being due to convergence. Five wren-babblers, from the genera *Napothera*, *Jabouilleia* and *Kenopia*, formed part of another clade, which drew members of three of Delacour's tribes, the Pellornini, Pomatorhinini and Turdoidini. The genus *Garrulax* threw up different groupings from those proposed by Berlioz: the latter's assumption, backed by Sibley and Ahlquist, that *Liocichla* was embedded among the laughingthrushes was rejected, and Delacour's view of a close relationship between *Turdoides* and *Garrulax* did not find good support. Finally, the colourful, long-tailed babblers of the genera *Heterophasia*, *Leiothrix*, *Minla*, *Liocichla* and *Actinodura* form a clade separate from the Turdoidini in which Delacour had placed them.

Thus, we are left with more than 80 genera holding a combined total of more than 300 babbler species, but with no clear means of sorting them further phylogenetically. The greatest con-

The genus *Stachyris*, as currently constituted, contains twelve variable species with strong bills and often striking plumage. Some species, such as the **Sooty Babbler** (*S. herberti*), are morphologically anomalous, and perhaps require genera of their own. Others, such as the **White-bibbed Babbler**, equate more closely to the "standard" model: stout legs and unbarred plumage made up of rich browns and striking patches of grey, black or white. This species is a Javan endemic, and, like its congeners, a noisy understorey bird, often encountered as a dominant component of mixed-species foraging flocks.

[*Stachyris thoracica*.  
Photo: Konrad Wothé]





Scimitar-babblers in the genus *Pomatorhinus* are large, pair- or group-living species, with powerful repetitive vocalizations. Duets or choruses are the norm. They have relatively long, slender, decurved and laterally compressed bills, which are often used to dig in soil. Their long bodies are emphasized by prominent graduated tails.

Several lead a semi-terrestrial life, and perhaps as a result their legs and feet are very strong, and the claws long, especially the hind claw. The **Rusty-cheeked Scimitar-babbler** is essentially terrestrial, foraging on the ground amongst leaf litter, and occasionally hopping thrush-like up low boughs. In the breeding season it is generally found in pairs or family groups, but in most of its range these units coalesce to form roving bands of up to 12 individuals during the non-breeding season.

[*Pomatorhinus erythrogenys*.

Photo: Dennis Avon/Ardea]





greater than 50,000 km<sup>2</sup>, over 30% of babbler species qualify, whereas less than 25% of the more vagile and widespread Turdidae, the thrushes and chats, do so. One Endemic Bird Area, the Central Himalayas EBA, is defined entirely by the ranges of three babblers, namely the Nepal Wren-babbler (*Pnoepyga immaculata*), the Spiny Babbler (*Turdoides nipalensis*) and the Hoary-throated Barwing (*Actinodura nipalensis*), although the last is found also in the Eastern Himalayas EBA, where the greatest concentration of restricted-range babblers, 13 species in total, occurs. Here, in the mid-elevation forests of the Himalayas, the babblers may constitute as much as 20% of all passerine species, the figure falling to 6–15% elsewhere in the forests and scrub of the Oriental Region, and far lower still in equivalent habitat in Africa. One can picture how the dispersal might possibly have taken place, perhaps keeping to the warm and seasonally stable regions, moving east along mountains and south and east through lowland forest to the deep-water barriers across the Indonesian archipelago, and westwards chiefly by means of the dry-country *Turdoides*, the only genus shared by Asia and Africa, in the savannas of which it found a new lease of life. Only a very few species, such as the ancestors of Elliot's Laughingthrush (*Trochalopteron elliotii*), moved north to settle exclusively in the Palearctic.

As already noted, DNA studies have made this a time of considerable flux for babbler taxonomy, which has, in any case, been under scrutiny recently in terms of the number of species that the family holds. Even the number of genera is very uncertain. Just as relatively sedentary birds tend to develop higher numbers of localized species, so, too, may distinctions evolve between groups of species that may be reflected by increased generic allocations. The thrushes and chats have 336 species distributed among 60 genera, a rate of 5.6 species per genus, whereas the babblers as presently constituted have 309 species distributed among 84 genera, a rate of 3.7 species per genus, which is a very high level of differentiation. The definitions of these genera, which are often obscure, merit consideration here; their vocal characters are outlined later (see Voice).

The African *Pseudoalcippe*, with two species, has similarities to *Illadopsis* but exhibits major behavioural and vocal differences. The former species are solitary, foraging in the manner of *Sylvia* warblers in the middle storey, rather than in undergrowth, and have a beautiful mellow song. The proximity of the genus to *Sylvia* has now been corroborated by DNA analysis. Asian *Chrysomma* is characterized by the possession of a very short

The eight members of the genus *Spelaeornis* are tiny birds characterized by rounded tails with only ten feathers, soft plumage, short slender bills, rather long delicate toes, and a loud mechanical song. They are generally reclusive in dense undergrowth and difficult to see well without voice playback. The *Spelaeornis* radiation is centred on the eastern Himalayas and Myanmar, where isolated populations have diverged. The **Bar-winged Wren-babbler** occurs fairly widely in this region.

[*Spelaeornis troglodytoides sherriffi*, Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India. Photo: Ramana Athreya]

centration of both species and genera is to be found in the eastern Himalayas and the ranges of adjacent western China, where a huge variety of habitats at different elevations and temperatures, and with different rainfall and seasonal regimes, was established as the mountains themselves arose, creating high levels of seasonal food resources among both invertebrates and plants. In India, for example, the bird list for the Buxa Tiger Reserve, in West Bengal, contains no fewer than 57 species of babbler, and this is by no means the highest number to be found at any one site. This region appears, therefore, to have been the cradle and long-term home of the timaliid radiation, in which the trophic adaptation to insectivory and frugivory on substrates less subject to seasonal extremes in food availability led to high levels of sedentariness, and this, in turn, led to high levels of local endemism.

Using the BirdLife International definition of endemism and "restricted range", which requires a species to occupy an area no



The *Pnoepyga* wren-babblers are tiny, semi-terrestrial birds with slender bills and diminutive front claws. Their tails consist of six extremely short rectrices, usually concealed by long rump feathers. Three of the four species come in two colour morphs. The individual pictured here is of the pale, or "white-scaled", morph of the **Pygmy Wren-babbler**, the most widespread member of the genus. It occurs from the Himalayas of Nepal and northern India, through South-east Asia to the Indonesian islands of Java and Timor. Some races, or groups of races, perhaps deserve treatment as species-level taxa.

[*Pnoepyga pusilla pusilla*, Doi Inthanon National Park, Thailand. Photo: Kanit Khanikul]

deep bill, a long graduated tail with the outer feathers about half the length of the central ones, and a clear, simple voice. The monospecific genus *Moupinia* differs from it in the reduced depth of the bill, generally smaller size and seemingly less rounded skull, which is perhaps a correlate of bill size in *Chrysomma*. *Chamaea*, the remarkable North American singleton in the family, and indisputably timaliid on both genetic and behavioural evidence, is at least superficially very close to *Moupinia* and a full analysis of the distinctions between the two is needed; the song of *Chamaea* is certainly less musical than that of *Moupinia*. All these species appear to group genetically close to *Sylvia*, and it may be that *Rhopophilus*, although treated with some suspicion in respect of its timaliid affinities and commonly regarded as a cisticolid, belongs in this general grouping, as perhaps do the parrotbills, towards which *Chrysomma* tends.

The monospecific fulvetta genus *Lioparus* has longer rictal bristles, a shorter, broader bill and a shorter hind claw than does *Fulvetta*, although its song is not greatly dissimilar to those of the latter. In plumage it is highly distinctive, with a head pattern recalling that of *Mesia* and bold wing and tail patterns suggestive of *Minla* and *Pseudominla*. *Fulvetta* itself, currently comprising eight simple-song species, has short rictal bristles and a long hind claw equal in length to the hind toe, presumably for hanging upside-down; unlike *Alcippe*, all eight species show to varying degrees a patterned wing, with bright panels or flashes on the folded outer primaries. The eight species of *Yuhina* have the bill very slightly to slightly decurved and relatively pointed, with well-developed rictal bristles, the head fully crested and the tail rather short and square; plumage colours are soft greys, browns and white, and each species displays streaking somewhere, on the flanks, the crest, the ear-coverts or the throat. *Staphida*, with three species, has a short thick bill, short rictal bristles, a short crest, a relatively long graduated tail, and the simplest imaginable song; the plumage colour and pattern are similar to those of *Yuhina*, but the whitish underparts suggest greater countershading.

In shape and bill morphology the bizarre monospecific *Dasyrotapha* resembles *Stachyris*, with which it was for long merged, but it probably belongs with the radiations of babblers in the Philippines, where six of the seven genera and 22 of the 23 species are endemic. Its bristly yellow forehead and elongate orange lateral crown plumes, along with its distinctive bare white ear-covert shafts, generally unusual plumage pattern and *Mesia*-like song, mark it out. *Sterrhoptilus* typically has a sharp slender

bill, moderate-length rictal bristles, relatively pointed wings, stiff, hair-like glossy crown feathers and streaked upperparts; the Golden-crowned Babbler (*Sterrhoptilus dennistouni*) exhibits the bristly yellow forehead and streaked upperparts of *Dasyrotapha*. The genus presently contains five species, although the two "pygmy babblers", distinct from the other three in their tiny size, proportionately shorter bill and general plumage pattern, merit taxonomic re-examination. The five *Zosterornis* babblers are slender and sharp-billed, with the plumage plain olive above and pale yellow below, four species having bold ventral streaking; the rictal bristles are shorter than those of *Sterrhoptilus*.

The rather plain *Alcippe*, with seven species sometimes referred to as "nun-babblers", has the culmen curved and the tail and wing of equal length, the former only slightly graduated. The upperparts are plain brown, usually greyer on the head and with a long dark lateral crownstripe, and the underparts are buffy to whitish. The three *Schoeniparus* fulvettas are like *Alcippe* and have very similar voices, but they are more strongly patterned, with stronger legs and feet and, as *Fulvetta*, a longer hind claw, and they display a tendency to keep close to the ground. The monospecific *Rhopocichla*, from south-west India and Sri Lanka, has the nostrils more rounded than those of *Alcippe*, well-developed rictal bristles and the tail shorter than the wing; the black crown and face are very distinctive, and it is not clear what its closest relatives are. Similarly, the monospecific Indian *Dumetia* resembles *Stachyris* in general appearance, but it has a longer tail, its eggs are spotted and it is a poor vocalist.

The genus *Stachyris*, with twelve species, is characterized by the possession of a strong bill, that of the larger species having the culmen gently curved. For those members for which the relevant information is available, the eggs are white, the Chestnut-winged Babbler (*Stachyris erythroptera*) being a partial exception in that the eggs of its Myanmar population are speckled reddish. The plumage colours and the size of *Stachyris* babblers are variable, from all brownish-black and large, as typified by the Sooty Babbler (*Stachyris herberti*), which is also aberrant in having a pale bill and may merit retention in its own genus, *Nigravis*, to brown, grey, white and small, as in the White-breasted Babbler (*Stachyris grammiceps*); species in between these extremes are a rich dark brown with various bold black and white markings. Even with the removal of four smaller babblers from *Stachyris* to *Stachyridopsis*, there is still some question over whether this amount of visible diversity is appropriately contained in a single genus.

The genus *Macronus* contains six species, two of which are rather distinctive in bearing elongated vaneless shafts from three separate tracts, one on the back and one on each flank. These bare shafts usually drape inconspicuously over the tail and wings, as demonstrated by this **Fluffy-backed Tit-babbler**, but they can be raised in a spectacular puff-backed display. The remaining four *Macronus* species lack these plumes and are rather different morphologically, with narrower bills and streaky underparts. They probably belong in a separate genus.

[*Macronus ptilosus*  
*ptilosus*,  
Taman Negara  
National Park,  
Malaysia.  
Photo: Jimmy Chew]







Seven Afrotropical species were once included in the Asian genera *Malacocincla* and *Trichastoma*, but this treatment overlooked their unique vocal and morphological features, including smaller bills, rictal bristles, legs and feet. All seven are characteristic birds of the understorey of African forests, where they are much more easily heard than seen. This is just as well because they are easier to identify by ear than by eye! They are now placed in the genus *Illadopsis*. The **Pale-breasted Illadopsis**, a typical example, is generally dull brown with a grey head and whitish underparts.

[*Illadopsis rufipennis* *rufipennis*, above Etome, Mt Cameroon, Cameroon. Photo: Doug Wechsler/VIREO]

Far more uniform are the 14 species of scimitar-babbler in *Pomatorhinus*, a genus typified by the relatively long, slender, decurved and laterally compressed bill, the rather long body emphasized by the graduated tail being longer than the wing, the long strong claws, notably the hind claw, and the duetting habit. In body shape, claw size, head pattern, with pale supercilium and throat, and song, the monospecific genus *Xiphirhynchus* is clearly very closely related to *Pomatorhinus*, but it possesses a much longer, much slenderer and still more curved bill, altogether of a different type.

*Sphenocichla*, with two rather similar-looking species, is distinguished by the sharp, pointed but relatively long conical bill. It has no rictal bristles, the tail feathers are greatly rounded, the legs are strong with a fairly long hind claw, and the songs are well structured. The much smaller *Spelaornis* wren-babblers, eight species in number, have a rounded tail with only ten feathers, soft full plumage, the females being slightly warmer below, a rather narrow short bill with a downward-sloping culmen, rather long delicate toes, and a loud mechanical song. The monospecific *Elachura* is very similar to *Spelaornis* and was once merged with it, but it has a decidedly longer bill and a very high-pitched song, seeming to link it with *Pnoepyga*. All four species in the latter genus have an extremely short tail consisting of only six soft feathers concealed by long ample rump feathers, along with a long thin bill, as long as that of *Elachura*, and relatively tiny front claws. Three of the four occur in two colour morphs.

The four *Stachyridopsis* species are distinguished from *Stachyris* by having the culmen entirely straight, making a shallow-based dagger shape, and their song is different in structure, with affinities to *Macronus*. The two species of *Micromacronus* are extremely small, with a thin and slightly decurved bill, tiny and slender legs and feet and, most distinctively, elongate and thickened white bare shafts extending backwards around the tail and wings from three points on the body, one on the back and one on each flank. Two of the six species of *Macronus*, the Fluffy-backed Tit-babbler (*Macronus ptilosus*) and Stripe-headed Tit-babbler (*Macronus striaticeps*), show the same arrangement of white vaneless shafts, but these are chunky, stout-billed birds and hence rather divergent from the remaining four, which are smaller, are narrower-billed, and have various intensities of streaking on pale yellow underparts and brown upperparts with no bare shafts; in this case, a reconsideration of generic limits seems, therefore, appropriate. Monospecific *Timalia* has peculiar rigid crown-

feather shafts, a relatively short, deep-based bill and a strongly graduated tail longer than the wing, but it groups with *Macronus* genetically.

The spelling of the genus *Macronus* has been a matter of some confusion. In the original 1835 description, it appeared as "*Macromus*" on the plate but "*Macronous*" in the text. The first spelling was in general use up to 1964, at which point the second was adopted by H. G. Deignan in J. L. Peters's *Check-list of Birds of the World*, thence spreading into a great deal of ornithological literature. However, in accordance with the ICZN Principle of the First Reviser, G. R. Gray's 1855 citation of both spellings and adoption of "*Macronus*" means that this form necessarily becomes the correct spelling.

The African Thrush-babbler (*Ptyrticus turdinus*), in yet another monospecific genus, is characterized by its thrush-like ap-



Five Asiatic species are grouped together in the genus *Malacocincla* on account of their strong legs, large feet, and relatively short tails. **Abbott's Babbler** is especially dumpy in structure, the head and bill appearing too large for the rear body and tail. This species is widespread and often common in lowland forests from Nepal to Sumatra and Borneo. Like its congeners, it is highly vocal and more readily encountered (and identified) by voice.

[*Malacocincla abbotti obscurior*, Taman Negara National Park, Malaysia. Photo: Ong Kiem Sian]

The genus *Pellorneum* is an unconvincing assemblage of eight Asiatic babbler species. These are rather variable but generally characterized by short, weak rictal bristles, relatively long legs and claws, and a tail shorter than the wing. The **Black-capped Babbler** typifies most of these species in being semi-terrestrial, and preferring to walk, rather than hop, when foraging. It is perhaps the most beautiful member of the genus, its inky black cap, white throat and rich rufous chest perfectly captured in this admirable portrait.

[*Pellorneum capistratum nigrocapitatum*,  
Khao Pra-Bang Khram  
Wildlife Sanctuary,  
Krabi, Thailand.  
Photo: Kanit Khanikul]



pearance, mid-brown above and white below with vague mid-brown breast spotting, and its bill and legs are also sturdy and thrush-like, the legs and toes in fact being stronger than those of a Song Thrush (*Turdus philomelos*), even though the babbler is considerably smaller and lighter than that species. The seven species of *Illadopsis* have some vocal similarity with *Ptyrticus*, but all are much smaller, with proportionately smaller bill and legs, and have rather uniform, restrained coloration. Their one-time placement in one or other of the Asian genera *Malacocincla* and *Trichastoma* failed to take account of the much shorter bill of *Illadopsis*, the shorter and less obvious rictal bristles, the somewhat smaller legs and feet, the more proportionate wing:tail ratio and the somewhat different voice.

*Pellorneum*, consisting of eight species, has short, weak rictal bristles and, except for the Marsh Babbler (*Pellorneum*

The **Bagobo Babbler** is restricted to the Philippine island of Mindanao. It is often placed in the genus *Malacocincla* but differs in a range of features, suggesting that the monotypic genus *Leonardina* should be retained. In particular, it has a relatively long tail and tarsi, short toes, and a more slender bill, with round rather than oval nostrils. Its vocalizations are also entirely different, more closely resembling those of another endemic Philippine genus, *Robsonius*.

[*Leonardina woodi*,  
Baracatan, Davao,  
Mindanao, Philippines.  
Photo: Doug Wechsler/  
VIREO]



*palustre*), a tail shorter than the wing, and fairly long strong legs and claws. The members of this genus commonly walk, but sometimes hop, and, again with the exception of the Marsh Babbler, have simple whistled songs. *Malacopteron*, with five species, possesses a rather long bill with an upcurved lower mandible and hook-tipped upper mandible, conspicuous rictal bristles, and small legs and feet, these last being related to its arboreal habits; in addition, it indulges in group songs and much song-duetting. The monospecific genus *Ophrydornis* has the bill, bristles and feet similar to those of *Malacopteron*, although the bill is somewhat shorter and broader-based; indeed, it is usually merged with *Malacopteron*, but it is proportionately shorter-tailed and "stubbier" in body shape, and has a distinctive head pattern. The five species of *Malacocincla* have the bill and rictal bristles as *Malacopteron*, but with strong legs, large feet, and the tail considerably shorter than the wing. *Trichastoma*, with three species, is very close to *Malacocincla*, from which it differs mainly in having a longer, better-proportioned tail.

The monospecific Philippine genus *Leonardina* has, like *Illadopsis*, been synonymized with *Malacocincla*, by E. Mayr and Delacour, and with *Trichastoma*, by Sibley and B. L. Monroe, but it differs from both in its longer tarsus, shorter toes, rounded rather than oval nostril, slenderer bill, and entirely different song. The song is like that of another Philippine endemic, *Robsonius*, the two species of which are commonly placed in *Napothera* but, apart from their insect-like voice, differ from that genus in lacking rictal bristles and in having part-feathered nares, broad white tips on the wing-coverts and outer primaries, copious elongate rump feathering, a fairly long and slightly hooked bill, and a walking habit.

Yet another monospecific genus, *Kenopia*, is a distinctive small babbler with a rather deep, slightly hooked bill, and stiff brush-like loreal feathering. It hints at *Robsonius* in its lack of rictal bristles and its rather fluffy dense rump feathering, while the long white markings on the breast side and back are suggestive also of *Ptilocichla*, although its feet are proportionately rather small, indicating its less exclusively terrestrial behaviour. *Ptilocichla*, with three species, has a rather long, hook-tipped bill, very short, weak rictal bristles if present at all, and powerful legs and feet, as well as a distinctive plumage pattern with elongate breast and flank feathers marked with long white streaks, and, as *Robsonius*, copious rump feathering. Indeed, in bill shape and head pattern the Palawan Ground-babbler (*Ptilocichla falcata*)



rather resembles *Robsonius*, while the Bornean Ground-babbler (*Ptilocichla leucogrammica*) has been reported as having the appearance, gait and call tonality of the quite unrelated Rail-babbler, although this second parallel, if not the first, must certainly be a case of convergence.

In most lists, the genus *Napothera* consists of nine species, as it incorporates the genera *Robsonius*, *Turdinus* and *Gypsophila*. The two *Robsonius* species, mentioned above, are normally treated as conspecific. Of the others, the four species in *Turdinus* form a clear group, all fairly chunky medium-sized babblers with rather long, strong legs, feet and claws, the rump feathers notably copious, long rictal bristles, rather dark plumage with scalloped, marbled and diffusely streaked patterning, and simple songs. The somewhat smaller monospecific *Gypsophila*, which most closely resembles the Large Wren-babbler (*Turdinus macrodactylus*), has much shorter rictal bristles, feathering over the basal part of the nares, notably short rounded wings, and distinctive vocalizations. The three *Napothera* species, differing slightly in size but all smaller than *Gypsophila*, are united by their simple piping songs, the fact that the tail is shorter than the wing, the possession of fluffy rump feathering, and a colour pattern of dark brown upperparts with blackish scales and pale streaks, a whitish throat and tan-coloured, slightly streaky breast and belly. The two smaller species have a medium-length bill, short rictal bristles, and small whitish spots on the tips of the upperwing-coverts and flight-feathers, while the Mountain Wren-babbler (*Napothera crassa*) possesses a proportionately rather shorter bill and long rictal bristles, and has no spots on the wings. If these features of the last-mentioned species were considered worthy of generic recognition, the name *Lanioturdinus* is available, but molecular evidence suggests that it is not divergent from its congeners, the Streaked (*Napothera brevicaudata*) and Eyebrowed Wren-babblers (*Napothera epilepidota*). *Rimator* belongs here, having echoes of *Ptilocichla* in its elongate underpart feathering with long pale streaks, and of *Napothera* in its simple piping whistle, short rictal bristles, dark brown and buffy-tan overall coloration and lax plumage, but it stands alone for its long decurved bill equal in length to or longer than the head, its short rictal bristles, its very short tail, and its very strong legs and feet and fairly long and sturdy claws, notably the hind claw. The genus *Jabouilleia* was established for the Indochinese Wren-babbler (*Rimator danjoui*) but there appear to be no significant differences between this and the three other *Rimator* species apart from its greater size and

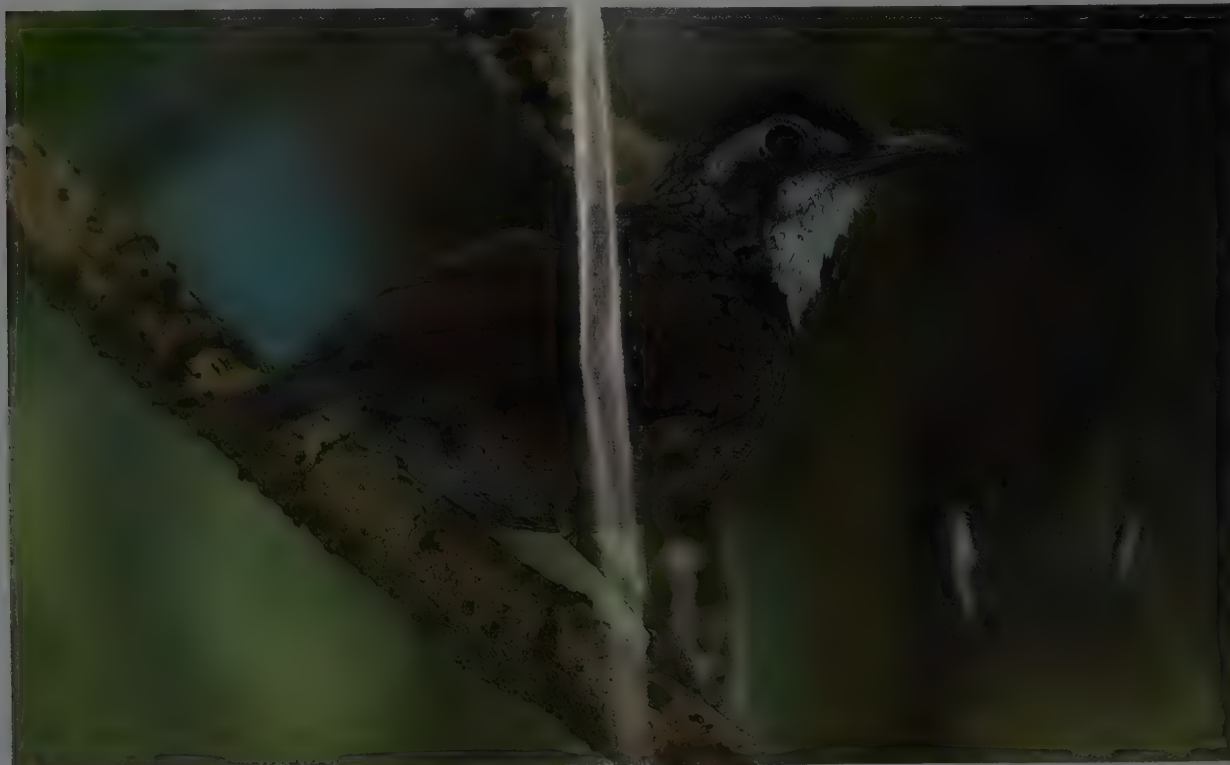


apparent underpart streaking; Cibois's DNA analysis showed *Jabouilleia* to be close to *Napothera* as presently defined.

The two bamboo-specialist *Gampsorhynchus* babblers are distinguished by their deep, hook-tipped, rather shrike-like bill, long, strong rictal bristles, long graduated tail, and strikingly pale coloration, pale brown above with white head and underparts, as well as their highly social behaviour with its concomitant noisy grating cackling. Molecular studies place this unusual genus close to the very different-looking *Pseudominla*, a genus of four species in which the tail is shorter than the wing, the rictal bristles are short, the bill is narrow and the voice is relatively pleasant. *Pseudominla* has a streaked crown and white or yellow supercilium, and the wing of some species is boldly patterned. Because it

The genus *Ptilocichla* contains a trio of species with rather long, hook-tipped bills, short rictal bristles, and sturdy legs and feet, the latter being adaptations for a semi-terrestrial lifestyle. The plumage is relatively full and copious on the rump, and marked with long spear-like streaks on the breast and flanks. All members of the genus inhabit humid evergreen forests, with one form on Borneo, another on Palawan, and the third, the **Streaked Ground-babbler**, occurring more widely on islands of the Philippine archipelago.

[*Ptilocichla mindanensis*, Pasonanca Watershed, Zamboanga, Mindanao, Philippines.  
Photo: Robert Hutchinson/ Birdtour Asia]



As their scientific name suggests, the *Turdinus* babblers resemble short-tailed thrushes. They are a well-defined group of four reclusive, bulky, semi-terrestrial species inhabiting the lower strata of humid forests. Their legs, feet and claws are long and sturdy, their rictal bristles long, and their rather dark plumage is generally scalloped or marbled. Like its congeners, the **Large Wren-babbler** has a loud, uncomplicated, whistled song, to which it responds aggressively. Its bare ocular skin is reminiscent of certain Neotropical antbirds (*Thamnophilidae*).

[*Turdinus macrodactylus* macrodactylus, Khao Pra-Bang Kham Wildlife Sanctuary, Krabi, Thailand.  
Photo: Kanit Khanikul]

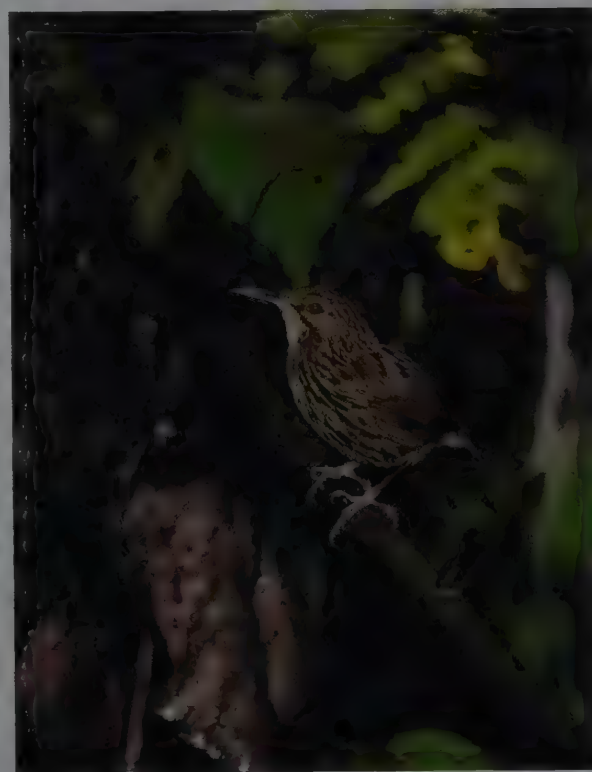
The genus *Napothera* contains three short-tailed, forest-dwelling species, each with copious rump plumage, dark brown upperparts with blackish scales and pale streaks, a whitish throat and tan-coloured breast and belly.

Their songs consist of simple piping whistles. Two of these species are widespread in South-east Asia, and another, the **Mountain Wren-babbler**, is restricted to Borneo. This island form is slightly larger, with a shorter bill and longer rictal bristles than its continental relatives. It also has no pale spots on the wing-coverts.

[*Napothera crassa*,  
Mount Kinabalu  
National Park,  
Sabah, Borneo.  
Photo: Leif Gabrielsen]



was formerly lumped, together with *Fulvetta* and *Schoeniparus*, in *Alcippe*, and as all four genera are known as fulvettas, it is worth summarizing some of their apparently diagnostic characters. Thus, *Fulvetta* has a small stubby bill, short rictal bristles, a long hind claw and a patterned wing; *Alcippe* has a short, stout bill, long rictal bristles, a shortish hind claw and an unpatterned wing; *Schoeniparus* is like *Alcippe* in its bill, rictal bristles and wing pattern, but with stronger legs; and *Pseudominla* possesses a relatively thin, long bill, fairly well-developed rictal bristles, a long hind claw and, with one exception, a patterned wing and, uniquely, crown. The one species in *Pseudominla* that fails fully to conform is the Yellow-throated Fulvetta (*Pseudominla cinerea*), whose wing has no "flash" or panel; this species is also



*Rimator* is a genus of peculiar, semi-terrestrial babblers. It once contained a single species, the **Long-billed Wren-babbler**, but this has increased to four species, with the elevation to species rank of two isolated forms from Sumatra and north Vietnam, and the inclusion of another monotypic genus (*Jabouilleia*). All these species have long, decurved bills, short tails, and strong legs, feet and claws. Their songs consist of long piping whistles, and this is often the best clue to their presence. They are generally furtive and inconspicuous, foraging close to the ground in evergreen forests.

[*Rimator malacoptilus*,  
Eaglenest Wildlife  
Sanctuary,  
Arunachal Pradesh, India.  
Photo: Ramana Athreya]

remarkable for the way in which, in museum specimens, the yellow of the plumage fades so much that the upperparts become dull grey and the underparts whitish. Whether there is taxonomic information in these features remains to be decided. As E. Pasquet's recent phylogeny suggested that *Pseudominla* and *Schoeniparus* are not mutually monophyletic, whereas morphological evidence indicates that these two groups possess unique characters, further analysis will probably be necessary.

Containing a total of 29 species, *Turdoides* is the largest genus in the family. It is characterized by the possession of a strong, point-tipped bill both mandibles of which are slightly decurved, short rictal bristles, firm short forehead feathering, a long, well-graduated tail and, with the exception of the black-and-white Southern Pied Babbler (*Turdoides bicolor*), a relatively drab coloration of pale brown, pale grey and whitish, sometimes darker brown and grey, almost always with some streaking or scaled effect on the crown, back or breast. One of its members, the Spiny Babbler, is distinctive owing to the sharp pointed tips of the feathers of the upperparts and, especially, the underparts, and because of its unusually musical song. Wolters revived the genus *Acanthoptila* for this species, but more work is needed to justify the following of this lead. The same is true for his use of the genus *Argya* for the species *gularis*, *longirostris*, *malcolmi*, *subrufa*, *earlei*, *caudata*, *altirostris*, *squamiceps* (type of the genus), *fulva*, *rubiginosa* and *aylmeri*. *Argya* is supposed to apply to those species having a longer, more graduated tail, a longer, slenderer bill and a less rounded wing, but the aforementioned species do not all conform to this definition and it is not clear which criteria they may meet. On the other hand, the relatively small, slender African species of *Turdoides* often known as "chatterers", namely the Fulvous (*Turdoides fulva*), Bare-eyed (*Turdoides aylmeri*) and Rusty Babblers (*Turdoides rubiginosa*), have quieter and higher-pitched contact calls and more skulking behaviour than those of other members of the genus, but it remains unclear whether a full assessment of all the species would reveal constant discrepancies in morphology, voice and behaviour worthy of taxonomic recognition beyond the subgenus.

Two small African forest genera, *Phyllanthus*, with one species, and *Kupeornis*, with three, may possibly prove to derive from *Turdoides*, since both live in flocks and perform chattering choruses, and both have the same general appearance and shape, with short rictal bristles. Moreover, *Phyllanthus* is very like *Turdoides* in foraging habits and *Kupeornis* is judged to fly in a manner very like that of *Turdoides*. *Phyllanthus* is, however,



shorter-tailed and much stronger-legged, and has a distinctive rich dark chestnut or blackish-maroon plumage with a grey hood. One species of *Kupeornis*, the White-throated Mountain Babbler (*Kupeornis gilberti*), is notably similar to *Phyllanthus*, being only slightly smaller, with proportionately smaller bill and legs, and with a similar coloration, albeit with a white face and throat. The three *Kupeornis* are, however, united by the possession of very short rictal bristles, a short to medium-length yellowish bill, a pale iris, a capped appearance with erectile crown feathers, a rather short rounded tail, and a strongly curved hind claw, the last utilized during acrobatic foraging on branches.

*Cutia* is a delightful anomaly, a remarkable mix of colours and patterns quite unlike those of any other babbler, but, as in many of the family, with a large colourful wingpanel. In addition, it exhibits strong sexual dimorphism, has the bill decurved to a point like that of a miniature *Turdoides* and with a very slight notch at the tip of the upper mandible, and has very short rictal bristles and greatly developed uppertail-coverts. It was long thought to be related to *Pteruthius*, also brightly coloured, sexually dimorphic, strong-billed and canopy-dwelling, but molecular evidence does not support such an affiliation.

The genus *Garrulax* formerly encompassed an enormous variety of species, with some of the most striking and beautiful of colours. Indeed, the multiplicity of colorations, along with their relatively large size, rather strong, medium-length bill, powerful legs and feet, short wings, and long rounded or graduated tail, was a kind of taxonomic character that held them together. As noted earlier, Wolters took the step of breaking down Delacour's great genus into far smaller components, and P. C. Rasmussen and J. C. Anderton, in their *Birds of South Asia*, published in 2005, were the first popularizers of this revised approach. In the present treatment, the "old" *Garrulax* is divided into eleven genera, including *Babax*, which Delacour treated separately but which has been found genetically to sit among various other members of the old genus. Even so, it is by no means clear that the attributions to genus in the current treatment are correct or appropriate, or even that the number of genera is yet correct; there may be too many, but there may also be too few. Moreover, the sequence both of genera and of species within each genus is little short of guesswork. Considerable revision is undoubtedly still required.

*Dryonastes*, with eleven rather divergent species, cannot easily be diagnosed. Most of its members have the nostrils half-hidden by forward-lying bristles, and a bill that is shorter than

the head, although the Wynaad Laughingthrush (*Dryonastes delesserti*) breaks this second rule. They are also generally smaller in size than species of *Garrulax*, as currently constituted, which have the nostrils supposedly most exposed. All have a short-bristled loral area, black in all except the Rusty Laughingthrush (*Dryonastes poecilorhynchus*) of Taiwan, but this is a character that the genus shares with *Garrulax* except for the two necklaced laughingthrushes and Sri Lanka's Ashy-headed Laughingthrush (*Garrulax cinereifrons*), something which may be taxonomically indicative. All except one of the *Garrulax* species with a bristly loral region have this area black; the exception is the Rufous-fronted Laughingthrush (*Garrulax rufifrons*) of Java, in which the loral area is chestnut, as that of the Rusty Laughingthrush, possibly suggesting a cross-generic link between these two taxa. In terms of song, *Dryonastes* can be subdivided into three groups, these according also with their social structures (see Voice), but it is not yet clear whether this is of taxonomic value. The first three species in the sequence, the Grey-sided (*Dryonastes caerulatus*), Chestnut-winged (*Dryonastes berthemyi*) and Rusty Laughingthrushes, form a distinctive soft-plumaged group with particular attributes that might warrant generic separation. One final character that separates *Dryonastes* from *Garrulax* reasonably well is the presence of a paler panel on the primaries formed by more brightly coloured fringes than those on the rest of the wing, but this is a feature displayed better by the two necklaced laughingthrushes than it is by a couple of species here assigned to *Dryonastes*. Moreover, there is an interesting morphological parallel between the Rufous-necked Laughingthrush (*Dryonastes ruficollis*) and the Rufous-cheeked Laughingthrush (*Garrulax castanotis*) that suggests a link between the two, despite their difference in size. Both genera have moderately long rictal bristles.

*Garrulax*, now with 15 species, breaks into several groups. The first seven are the literal "laughing" songsters, and these share various characters, including large size, long and ample head feathering, and a tendency towards an abrupt, if sometimes subtle, change in colour between the breast and the lower underparts. The two necklaced laughingthrushes and two white-throated species, namely the White-throated (*Garrulax albogularis*) and Rufous-crowned Laughingthrushes (*Garrulax ruficeps*), share a breastband and a white-tipped tail, and the final four, the Masked (*Garrulax perspicillatus*), Rufous-fronted, Ashy-headed and Sunda Laughingthrushes (*Garrulax palliatus*), are all rather dull uniform brown, or brown and grey.



Gampsorhynchus babblers are distinguished by their deep, hook-tipped bill, long graduated tail, and strikingly pale coloration, including a distinctive white head. They are highly vocal and social, often occurring in mixed-species flocks, and spending much time in the middle storey of second growth and patches of bamboo. The genus probably contains two species-level taxa, with South-east Asian races here split off to form the **Collared Babbler**, named in reference to the partially concealed dark brown collar which separates the white head from the fawn body.

[*Gampsorhynchus torquatus torquatus*, Thailand.  
Photo: Roland Seitre]



*Turdoides*, the most species-rich babbler genus, is mainly associated with arid or open country. Its 29 members are a medley of muted colours, usually with distinct fine streaking or scaling; a few species are spectacularly pied. In all cases the bills are strong and sharp, with short rictal bristles at the base. The feathers of the forehead tend to be short and dense, while the tail is usually long and graduated.

The **Arrow-marked Babbler** typifies the group. It is widespread in Africa, occurring from Kenya to South Africa in savanna, thorn-forest, open woodland and the edges of cultivation. Sometimes, as pictured here, it occurs in reedbeds and the margins of wetlands. Like its congeners, it lives in noisy, co-operatively breeding groups.

[*Turdoides jardineii*  
convergens,  
Stone Hills Game  
Sanctuary,  
Zimbabwe.  
Photo: R. Peek]





*Melanocichla*, two species endemic in the Sundaic region, has a large, deep, rather short pale (red) bill with a steeply curving culmen, bare skin behind the eyes, all-dark plumage and a distinctive whooping voice. *Rhinocichla*, with a further two Sundaic species, also has a pale (yellow) bill and dark body plumage, but the bill is much smaller, the crown is distinctively coloured and there is a bold white wing flash; the rictal bristles are the most pronounced of those of all the laughingthrushes, whereas they are weak in *Melanocichla*.

The three species of *Babax* are superficially reminiscent of *Turdoides* with their streaky brown, buff and grey plumage and a rather long decurved bill, which also resembles that of the scimi-

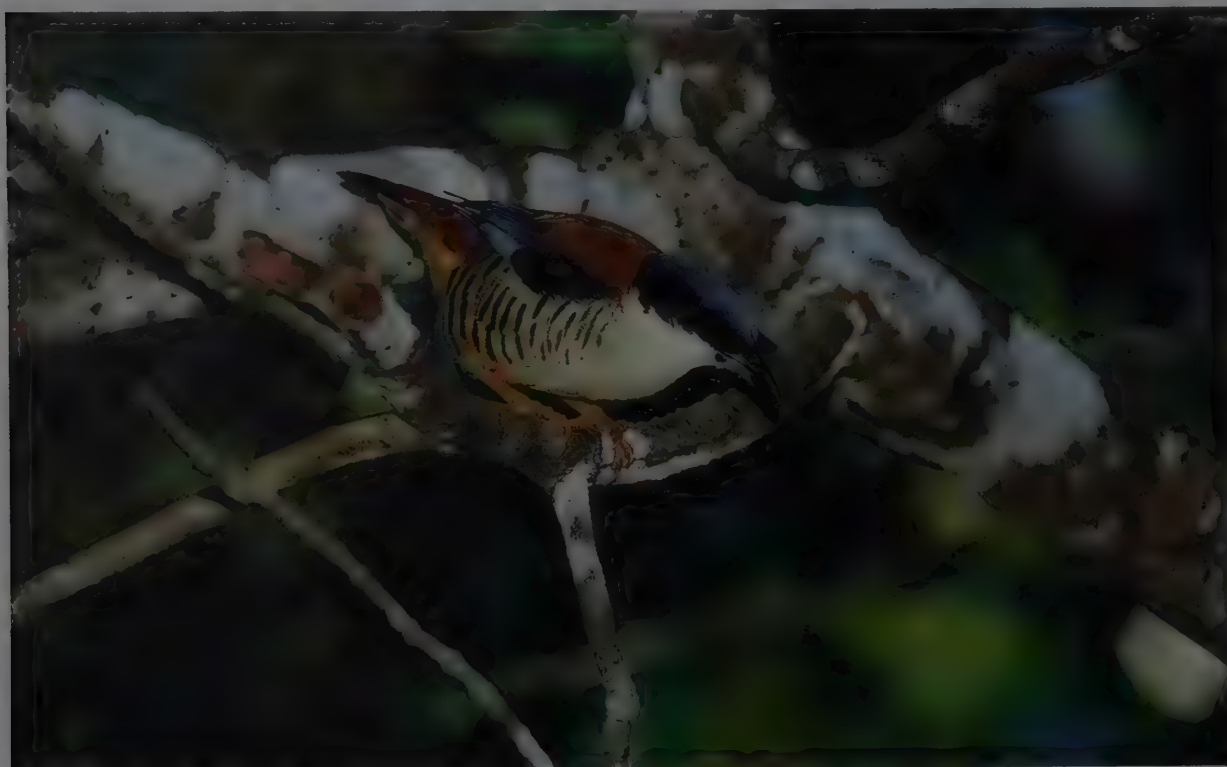
tar-babblers in *Pomatorhinus*; the song is a simple series of whistles. The monospecific *Grammatoptila*, although also large, brown and streaky, is perhaps only superficially similar to *Babax*, with the feathers of the body elongate and patterned as in *Ptilocichla*, a crest recalling that of the White-crested Laughingthrush (*Garrulax leucolophus*) and a uniquely deep, short bill resembling that of a turaco (*Tauraco*). In the rather small *Stactocichla*, containing two species, the bill is relatively long, straight and slender, the breast uniquely speckled, the tail relatively short, being roughly the length of the wing, and the song magnificent. *Leucodioptron* quite closely resembles *Stactocichla* and likewise consists of two species, with the Chinese Hwamei (*Leucodioptron canorum*) completing the white "eyebrow" only hinted at in the Spot-breasted Laughingthrush (*Stactocichla merulina*), but it has a shorter and deeper bill, the spots turn to narrow streaks, and the song, while rich, is simpler. The five species in *Strophocincla* are also small and reddish-brown, like members of *Stactocichla* and *Leucodioptron*, but with a relatively small, slender bill. The two species from southern India, however, lack the finely streaked plumage of the other three, and have much longer rictal bristles; they probably require a new genus.

The two species comprising *Pterorhinus* are united by their rather nondescript pattern and colour and their distinctive vocalizations, but they differ somewhat in bill morphology. In overall plumage they are close to *Ianthocincla*, or at least to one of its members, the Snowy-cheeked Laughingthrush (*Ianthocincla sukatschewi*). All eight species in the latter genus, however, are characterized by the possession of pale, usually white tips on at least the tertials and secondaries, and bold white or, in one case, rusty tips on the rectrices; all have a longish straight or slightly decurved bill and rather strongly coloured wingpanels, most present a capped effect, even if only by having no markings on the head but markings on the back, and there is a tendency towards scaling on the underparts. *Trochalopteron*, with its 16 species, continues that tendency and also exhibits coloured wingpanels, but the bill is generally smaller, the culmen more evenly decurved, the plumage is darker and richer in browns, greys and olive tones and, apart from a vestigial appearance in the Brown-capped Laughingthrush (*Trochalopteron austeni*), the flight-feathers lack pale tips.

As with many of the genera still to be reviewed, *Liocichla* has had its scientific name appropriated for the English vernacular, suggesting the exhaustion of the options for combining the

A single African species, the **Capuchin Babbler**, occupies the genus *Phyllanthus*. It bears some behavioural and structural similarities to *Turdoides* babblers but it is thicker-set, with much stronger legs and a shorter tail. Its plumage is mostly blackish with a unique rich maroon tinge, except for the head, which bears a distinctive grey hood. Like *Turdoides* babblers, it forages in chattering groups, but unlike them it inhabits lower and middle strata of humid evergreen forests.

[*Phyllanthus atripennis*.  
Photo: M. Hyett/VIREO]



The **Himalayan Cutia** is hardly recognizable as a babbler. Not only does it forage by creeping along branches in forest canopies like an overgrown nuthatch (*Sitta*), but it is strikingly patterned and colourful, with pronounced sexual dichromatism. Its bill is decurved and pointed, the upper mandible bearing a slight notch at the tip. The rictal bristles are very short, and the uppertail-coverts are long, almost covering the short tail. The Malaysian race, pictured here, has richer chestnut upperparts and a buffier vent than Himalayan and South-east Asian forms, as well as slightly different vocalizations.

[*Cutia nipalensis cervinicrissa*,  
Fraser's Hill, Malaysia.  
Photo: Bernard Van Elegem]



The genus *Dryonastes* contains eleven attractive species of Asiatic forests. They tend to have short, black bristles in the loreal area, with some of those bristles jutting forwards to conceal much of the nostril. Several taxa are also notable for the pale panel in the outer wing formed by fringes to the primaries. In general, however, it is difficult to pinpoint diagnostic features of this genus, making further taxonomic evaluations necessary using genetic analyses.

The **Blue-crowned Laughingthrush** is a localized Chinese endemic previously merged with the Yellow-throated Laughingthrush (*D. galbanus*).

[*Dryonastes courtoisi*.  
Photo: Greg & Yvonne  
Dean]



word “babbler” with some other descriptor, and readily falling back on the simplest solution. *Liocichlas* appear to be close to the “garrulacine” babblers—indeed, the two “red-faced” species, larger and longer-billed than the others, were sometimes treated in the old *Garrulax* or *Trochalopteron*—but they are characterized by their relatively small size and the sharply square-ended tail with narrow paler tips, the latter being red in three species. Four of the five *liocichlas*, the exception being the type species of the genus, have red outer edges at the tips of the tertials and secondaries, usually with a frayed effect; all have coloured wingpanels, and rather long rictal bristles and hind claw.

Five monospecific genera are united primarily by their small size and brilliant colours, particularly in the wings, but each has a distinctiveness that prevents it from being merged with another. The Bar-throated Minla (*Chrysominla strigula*) used to be treated in the genus *Minla*, but it is a larger bird, with a proportionately deeper, shorter bill, long rictal bristles and proportionately much longer, stronger tarsi, and also has a yellow crown and a very unusual pattern of neat barring on the throat. *Minla*, unusual for its sexual dimorphism in plumage, has a rather long thin bill and short rictal bristles, a head pattern and wingbar reminiscent of those of a *Pteruthius* shrike-babbler, and creeper-like habits. *Siva*, which has the size and bill shape of *Chrysominla*, has a squared-off tail with a narrow pale tip in a pattern that is reminiscent of the much larger *Liocichla*, and some of its subspecies have a bright cobalt wingpanel and uppertail quite unlike those of any other babbler. All three of these species share the *Liocichla* trait of white tips on the tertials and secondaries, setting them apart from the other two monospecific genera considered here. Nevertheless, the Red-billed *Leiothrix* (*Leiothrix lutea*) and the Blue-winged *Siva* (*Siva cyanouroptera*) have hybridized in captivity, confirming the reasonably close relationship that Cibois’s molecular work and, indeed, most taxonomic arrangements suggest. *Mesia* and *Leiothrix* are similar in several characters, including size, *Mesia* being slightly the larger, and red bill colour, rather long rictal bristles, yellowish-orange breast colour, a chestnut patch at the base of the folded primaries, yellow wing-fringing and greyish lower upperparts. *Leiothrix* even has a vestigially “silver ear”, but *Mesia* has a proportionately much larger bill and elongate silvery ear-coverts, while *Leiothrix* has a uniquely forked tail and elongate, white-edged uppertail-coverts.

*Crocias* is rather like *Cutia* in its pleasing oddness and in the difficulty of determining its systematic placement. Like *Cutia*, it

consists of two rather similar species that live high in the forest canopy. *Crocias* is a rather large, long babbler, grey-headed, brown-backed, white-bellied and with streaked flanks. Its deep strong bill has a hooked, notched tip, and it possesses medium-length rictal bristles and a long graduated tail.

The eight sibilas form a distinct group of specialized nectarivores. Without DNA details as a guide it is difficult to determine their placement within the babbler family, but, rather startlingly, molecular evidence puts them near *Leiothrix* and *Mesia*. The monospecific genus *Heterophasia*, which used to cover all the sibilas, is characterized by a rather long and slender decurved bill, medium-length rictal bristles, notably pointed wings, a very long tail twice the length of the wing and greatly graduated, and flocking behaviour, with no clear song. *Malacias*, with six species dressed in black, white, grey and/or brick-buff, is close to *Heterophasia* but with a rather shorter though same-shaped bill, slightly longer rictal bristles, a less pointed wing, a much shorter tail and a very different voice. *Leioptila*, with a single species, while sibia-like in size and shape, is less nectarivorous and its bill is less specialized, the rictal bristles are short, its song is less high-pitched, and it has a plumage resembling that of *Minla*.

The seven barwings in the genus *Actinodura* resemble the *Malacias* sibilas in size and tail length, but they form a still more uniform group, characterized by brown general coloration, dense black barring on the wings and usually the tail, erectile crown feathers, long rictal bristles, and a moderately strong but short bill. Molecular evidence places them near the minlas.

Towards the end of the sequence, there are six monospecific genera, three in Asia and three in Africa, which appear to be timaliid but about the relationships of which very little is known. *Myzornis* may be an offshoot of the small bright *Leiothrix*–*Minla*–*Siva* group, with which it has similarities in wing and tail patterns, or is perhaps derived from the sibilas, with which it shares a nectar-feeding habit and a relatively long decurved, albeit very thin bill. *Malia*, with the exception of the laughingthrushes the largest babbler, if indeed it is a babbler, is even more of a mystery, being unusually nondescript, with very short rictal bristles, short feathering to the base of the nostrils, short wings and a fairly long tail; the bill is rather long and straight but decurved at the tip, with a slight overhang, and the legs and feet are very strong. Although morphology is not, of course, the only consideration in terms of affinities and relationships, *Rhopophilus*, dis-





Previously more extensive, the genus *Garrulax* has contracted as a result of taxonomic revisions. As currently composed, it contains 15 species of Asiatic forests but even this group can be broken down into subgroups. One of these contains large species with pectoral colour-shifts and classic "laughing" songs or choruses. Another group has different vocalizations and a tendency towards pale throats, dark chest-bands, and white-tipped tails. A member of this latter group, the **White-throated Laughingthrush**, is a widespread species, occurring in a range of wooded habitats from Pakistan to south China.

[*Garrulax albogularis*,  
India.

Photo: Christian Artuso]

cussed near the beginning of this section, shows no morphological characters that obviously debar it from membership of the Cisticolidae. It is, for example, a very close match in size, shape, colour and pattern for the Rufous-vented Prinia (*Prinia burnesii*), although its bill, legs and feet are all rather stronger.

In Africa, *Lioptilus* is outwardly like a small *Kupeornis*, the members of which used to be subsumed in *Lioptilus*, but it is relatively short-billed and short-legged, is frugivorous, and has a melodious song. It is, curiously, extremely similar in size and shape to *Mesia* and, while nothing like so colourful, it shares the reddish bill, black cap, lower-upperpart shading and central tail

colour of *Mesia*, and even has slightly silvery ear-coverts. As noted in the earlier paragraphs of this section, however, molecular evidence indicates that *Lioptilus* belongs near the Old World warbler genus *Sylvia*. Similarly, *Parophasma* may well be closer to the Old World warblers. It, too, sings beautifully, and it has the size and shape of a large *Sylvia*, such as the Orphean Warbler (*Sylvia hortensis*), although its bill is deeper and more hook-tipped, doubtless as a result of its berry diet. Its dull coloration and rufous-chestnut vent have together suggested a link to *Kupeornis*, but this seems less probable than does the sylviid option. The third and last of these monospecific African genera, *Horizorhinus*, has a bill much like that of *Parophasma*, rather powerful, deep and decurved to an overhanging tip, but its tarsi are longer and it has softer plumage, rather copious on the rump; its vocalizations again point to a possible link with *Sylvia*.

Molecular-genetic studies by Cibois and others indicate that the shrike-babbler genus *Pteruthius* should, in fact, be placed in the family Vireonidae. The five species in this genus are very divergent in size and coloration, but are united by the possession of a stout black hook-tipped bill, short rectal bristles, colourful plumage that is sexually dimorphic, a distinct juvenile plumage, a heavy-set body, slow arboreal movements, and simple monotonous songs. The monospecific *Erpornis*, once merged with *Yuhina*, has a slender bill with the tip slightly bent over, strong but short rectal bristles, a relatively prominent short crest, a squared-off tail, rather short and dainty legs and feet, and a tit-like call.

A suite of African monospecific genera, one genus with two species, and a single monospecific Malagasy genus, all of them long neglected in avian systematics but either certainly or probably not timaliids, conclude the sequence. Rich brown above and greyish-white below, *Kakamega* has been examined in detail by Mann and co-workers, who showed it to differ from the superficially similar *Illadopsis* in its very reduced rectal bristles, longer tongue and a host of minor anatomical details; before that, it was sometimes treated in *Trichastoma* and sometimes placed in the chat genus *Alethe*. The Spot-throat, too, has an intriguing history of generic allocations, in *Turdinus* to begin with; it is very similar in size, bill shape and proportions to *Kakamega*, its rump and tail are the same rich brown, and both species have a lightly maculate throat, although *Kakamega* has notably stronger legs and feet. The olive-and-yellow Dapple-throat, originally regarded

The genus *Melanocichla* contains two species of subtropical forests in the Sundaic region.

The **Black Laughingthrush** occurs in south Thailand, Peninsular Malaysia and Sumatra, while the closely related **Bare-headed Laughingthrush** (*M. calva*) is restricted to the mountains of north Borneo. Both these forms have dark plumage, short rectal bristles, pale reddish bills, and a distinctive whooping voice. The species pictured here has a patch of bare bluish-white skin behind the eyes, while the bare patch is yellowish in the Bornean form, and extended to cover much of the head.

[*Melanocichla lugubris*,  
Fraser's Hill, Malaysia.  
Photo: Morten Strange]





Two *Sundaic* laughingthrushes have chestnut on the head, prominent rictal bristles, bold white wing flashes, and relatively small, pale yellow-orange bills. One of these is the **Chestnut-hooded Laughingthrush** of Bornean highlands, previously considered conspecific with the **Spectacled Laughingthrush** (*Rhinocichla mitrata*) of Peninsular Malaysia and Sumatra. Both these forms inhabit humid shrubby areas and forest edge in the subtropical zone.

[*Rhinocichla treacheri treacheri*, Mount Kinabalu National Park, Sabah, Borneo.]

Photo: Leif Gabrielsen]



as a *Phyllastrephus* bulbul, is again of very similar proportions to *Kakamega*, and likewise with warm brown uppertail-coverts and tail and a lightly maculate throat. That molecular analyses should show these three genera, *Kakamega*, *Modulatrix* and *Arcanator*, to be related, as mentioned earlier in this section, seems entirely plausible.

In taxonomic terms, *Achaetops* is something of a mystery bird, thrown up by Namibia as a partner for the Herero Chat-flycatcher (*Namibornis herero*), the latter currently placed in the family Muscicapidae. Osteologically, it is indistinguishable from *Chaetops*, which it resembles quite closely in its upperpart streaking, fluffy rufous-chestnut rump feathers, bold white submoustachial line and petrophilous habits. On the other hand, it also resembles two sylviids, the Cape Grass-warbler (*Sphenoeacus afer*) and Moustached Grass-warbler (*Melocichla mentalis*), in certain aspects of its plumage and, in contrast to *Chaetops*, its song is a rich warbling and its gait a mouse-like run. Some features of its skull are timaliid, but it has been observed that *Sphenoeacus* itself may prove to be a babbler, rather than a warbler. *Chaetops* embraces two closely related, highly distinctive species, rather large, with powerful legs for hopping around rocky terrain. The genetic distinctiveness of *Chaetops*, and the fact that it is distinct in its behaviour and breeding biology, as well as structure, suggests that it merits placement in a family of its own.

Finally, *Mystacornis* is distinguished by its strikingly long, straight and rather narrow bill with a slight hook at the tip, its long tarsi with what are, for a ground-dweller, rather slender toes, its absence of rictal bristles, and the plush dense loreal feathering, as well as the fairly short wings and tail and, in the male only, a very bold head pattern. The single species is confined to Madagascar.

From the foregoing review, it could hardly be clearer that the taxonomy of the Timaliidae is far from being agreed upon and stable. Even if it were much clearer which genera are truly timaliid and how they fit together, there is still the matter of species limits. Since the start of the twenty-first century, a considerable amount of revision of species limits has been carried out, this based mainly on simple morphological and/or geographical parameters, but there is certainly more to be done involving the combination of morphological, vocal, behavioural and molecular information.

## Morphological Aspects

Babbler plumage varies from being rather hard to being soft and lax, and in many species the back, rump and sometimes flank feathering tends to be soft and profuse. Some species have modifications, especially on the forecrown, and the ear-coverts are frequently lightly streaked or in some way differentiated, even if only slightly, from the surrounding colour. The skin is of medium toughness. Rictal bristles are present, usually not exaggerated, and sometimes very inconspicuous. The wings are short and rounded, with ten primaries; the outermost primary, P10, is

Three species of large babbler bear a superficial resemblance to Turdoides in their streaky brown, buff and grey plumage, or to Pomatorhinus in their large, graduated tails and decurved bills. They are grouped together in the genus *Babax*, and occur mainly in the eastern Himalayas. The **Chinese Babax** inhabits open broadleaved evergreen forest, forest edge, secondary growth, tall grass, and bamboo, in the mountains of north-east India, north Myanmar, and south China. The distinctive form woodi, seen here, may be a separate species.

[*Babax lanceolatus woodi*, Mt Victoria, Myanmar. Photo: Robert Hutchinson/ Birdtour Asia]





30–70% shorter than the longest, and the outermost primaries are often notably decurved. Except in the genera *Spelaornis* and *Pnoepyga*, the tail has twelve feathers, and is usually relatively long, often fairly to strongly graduated, or rounded but with the outermost rectrix shorter than the others. The bill is generally rather robust but not very deep, sometimes notched at the tip of the upper mandible, with the culmen often slightly decurved, but bill shape and size are highly variable within the family. The legs and toes are sturdy, with a scutellate tarsus, the leg muscles being well developed. The iris is much more frequently pale than is the case with most other passerine families. The syrinx lacks the "turdine thumb" which helps to characterize the thrushes and chats of the family Turdidae and the Old World flycatchers, the Muscicapidae. The stomach of those few timaliids for which relevant information is available, for example the Orange-billed Babbler (*Turdoides rufescens*), the Brown-capped Babbler (*Pellorneum fuscicapillus*) and, on a British Natural History Museum label, the Red-billed Leiothrix, is very muscular.

"Tit-babbler", "wren-babbler", "laughingthrush", "wren-tit", "thrush-babbler", "jay-thrush", "shrike-babbler", "flycatcher-babbler"—these English vernacular names capture something of the morphological diversity of the babbler radiation, indicating how some of the taxa have filled niches or developed characters that European ornithologists associate with more familiar species, but they fall well short of doing it full justice. In terms of size, colour, pattern and shape, all of which reflect the great variety of niches and habitats, from desert fringes to deep rainforest, that the timaliids occupy, the variation to be found in this one family is unusually high and, taken as a whole, is probably unmatched by any other in the class Aves.

The smallest members of the family are the sensational Visayan Miniature Babbler (*Micromacronus leytenis*) and its twin, the Mindanao Miniature Babbler (*Micromacronus sordidus*), creatures that, at 7–8 cm in length and weighing as little as 5.5 g, are so tiny that, hummingbirds (Trochilidae) aside, they come close to being the smallest birds on earth, rivalling the Pygmy Tit (*Psaltria exilis*) of Java. The largest babbler, by way of contrast, is the Greater Necklaced Laughingthrush (*Garrulax pectoralis*), which, at 34.5 cm and up to 170 g, just exceeds the Giant Babax (*Babax waddelli*) in length and weight and is 30 times the weight of *Micromacronus*. Between these extremes there is a fairly steady



Five small, nondescript, slender-billed, lightly streaked species are placed in the genus *Strophocincla*. The **Streaked Laughingthrush** is typical of this group, not only because it is generally reddish-brown, but because its distribution is centred on the Indian Subcontinent. It inhabits a variety of scrub and cultivation types in the Himalayan montane zone, sometimes ascending to near 4000 m. The two southern Indian *Strophocincla* are somewhat more uniform, and have relatively long rictal bristles; it may prove necessary to erect a separate genus for these forms.

[*Strophocincla lineata lineata*,  
Naini Tal, India.  
Photo: Ketil Knudsen]

continuum in sizes, with other tiny species such as the two pygmy babblers in *Sterrhoptilus* and the virtually tailless *Pnoepyga*, and other fairly hulking laughingthrushes in *Garrulax*, *Babax*, *Grammatoptila* and *Dryonastes*, along with *Malia* and the larger *Turdoides*. As a rule, all of these birds tend to be rather heavier-bodied and chunkier, with proportionately stronger bill and legs, than species of similar dimensions in the families Turdidae, Muscicapidae and Sylviidae.

Matching the wide variation in size is a similarly wide variation in colour. Many species are, however, rather plain and cryp-



The **Plain Laughingthrush** inhabits scrub, thickets, and moor-like terrain at medium altitudes of 1600–3300 m in Asian mountains. As its name suggests, it is unremittingly non-descript. In this regard it is similar to its only congener in the genus *Pterorhinus*, the White-browed Laughingthrush (*P. sannio*), which also has a global range centred on China. These two forms are united by their distinctive vocalizations and dull plumage, but differ in bill morphology.

[*Pterorhinus davidi davidi*,  
Xining, Qinghai, China.  
Photo: John & Jemi  
Holmes]

tic, perhaps none more so than the mainly dull brown *Trichastoma*, *Malacocincla*, *Pellorneum* and *Malacopteron* babblers of forest undergrowth in South-east Asia and the Sundaic region, although the *Malacopteron* species, inhabiting the lower to middle storey, are notably more countershaded, with paler underside, than are the others. The eight wren-babbler genera *Spelaornis*, *Elachura*, *Pnoepyga*, *Kenopia*, *Turdinus*, *Gypsophila*, *Napothera* and *Rimtor*, together with the formerly named wren-babblers in *Sphenocichla*, *Robsonius* and *Ptilocichla*, possess streaked or scaled, barred or spotted upperparts and, usually, closely patterned underparts with little countershading, all in various mixes of brown, rufous, black, grey, buff and white to match and merge with the complex low vegetation that they inhabit at the edges and in the interior of forest. The "nun-babblers" of the genus *Alcippe*, with their grey head, brown upperparts and buff underparts, are bewilderingly understated. Always excepting the spectacularly distinctive white-and-black Southern Pied Babbler, the genus *Turdoides* consists of brown, rufous, buff, grey, blackish and whitish species, with varying amounts of cryptic streaking, inhabiting arid landscapes.

The laughingthrush genera *Babax*, *Strophocincla*, *Stactocichla* and *Leucodioptron* and the intriguing African *Ptyrticus* are similarly coloured, but with bolder patterns of streaks and spots, while such genera as *Pomatorhinus* and *Stachyris* combine a sometimes strong black-and-white head pattern with concealing browns and rufous, leading to still more richly camouflaged plumages in the densely patterned barwings (*Actinodura*), and reaching apotheosis in the wonderful Giant Laughingthrush (*Ianthocincla maxima*) and Spotted Laughingthrush (*Ianthocincla ocellata*). The colours and patterns of these latter species seem far too striking to be cryptic, but in context the spots and bars and patches of rufous and black clearly have a disruptive effect on the birds' outline. This may be true of many of the other laughingthrushes in the genera *Ianthocincla*, *Garrulax*, *Dryonastes* and *Trochalopteron*, for their many and various beautiful splashes of colour—black, white, chestnut, golden-yellow, rufous, crimson—are not so bold at any distance beyond close range as to make them stand out. Only a few species, such as the White-crested Laughingthrush, the Black-and-white Laughingthrush (*Garrulax bicolor*), two *Gampsorhynchus* babblers and the Southern Pied Babbler, have evolved an aposematic conspicuousness, for which their

aggressiveness and strength of numbers doubtless compensate. Other brightly coloured species, such as the sibilas, the Blue-winged Siva, the minlas and cutias, the Fire-tailed *Myzornis* and the shrike-babblers, all tend to deploy white, yellow or green to countershade and camouflage the sharper patterns.

A feature of several babblers is a long blackish lateral crownstripe, present in several genera. Thus, it is exhibited by the Crimson-faced *Liocichla* (*Liocichla phoenicea*), the Blue-winged Laughingthrush (*Trochalopteron squamatum*), the Striated Laughingthrush (*Grammatoptila striata*), the Striped Wren-babbler (*Kenopia striata*), the Taiwan Yuhina (*Yuhina brunneiceps*), most *Schoeniparus* and *Alcippe* fulvetas and, incidentally, several species of parrotbill, these last currently separated in the family Paradoxornithidae. Another feature, much more prevalent, is the wingpanel produced by bright colour or colours, often two or three in sharp contrast, on the outer webs of the flight-feathers, and often combined with strongly coloured wing-coverts. This is a character shared by many species in many genera, which include *Lioparus*, *Yuhina*, *Schoeniparus*, *Pseudominla*, *Cutia*, *Garrulax*, *Grammatoptila*, *Rhinocincla*, *Ianthocincla*, *Trochalopteron*, *Liocichla*, *Chrysominla*, *Minla*, *Mesia*, *Leiothrix*, *Crocias*, *Heterophasia*, *Malacias*, *Leioptila*, *Siva*, *Actinodura* and *Myzornis*, and with traces in *Chrysomma*, *Macronous*, *Stachyris* and even one species of *Kupeornis*. Again, this feature is exhibited, very notably, by most species of parrotbill.

There are various other particular plumage ornamentations in the family. Several species have a crest, in all cases erectile, and these include the two yuhina genera *Yuhina* and *Staphida*, the Striated, White-crested and Black-and-white Laughingthrushes, the Hoary-throated Barwing and the White-bellied *Erpornis*; the Bar-throated Minla is "half-crested", with ragged crown feathers. Several species of laughingthrush have plush or bristly feathering on the forecrown, and a few have bare peri-orbital or postocular skin. The Yellow-eyed Babbler (*Chrysomma sinense*) has a bold orange eyering. Various genera, including *Pomatorhinus*, *Mesia*, *Leiothrix* and *Gampsorhynchus*, sport a bright red, orange or yellow bill. The Spiny Babbler has enlarged and pointed feather shafts on the back and, especially, the breast, so that its plumage really is spiny, and the Fluffy-backed Tit-babbler and several others in its genus have profuse soft rump feathering with long bare white shafts, a feature shared

*Trochalopteron*, with 16 species, is one of the most speciose timaliid genera. Its members are characterized by small bills, scaling on the body plumage and wingpanels formed by contrasting fringes to the remiges.

These features are demonstrated here by **Elliot's Laughingthrush**, a species of thickets, undergrowth, bamboo, open forests and gardens in an unusually wide altitudinal range of 1000–4200 m. The epicentre of the *Trochalopteron* radiation is in the Himalayas, especially the eastern Himalayas, but some forms occur as far afield as Taiwan.

[*Trochalopteron ellioti*, Zhuokeji, Sichuan, China.  
Photo: John & Jemi Holmes]







Of the five *Liocichla* species, only two have red faces, and both were previously treated as *Garrulax* or *Trochalopteron* laughingthrushes. They are the **Scarlet-faced *Liocichla***, a beautiful species from the mountains of South-east Asia, and **Crimson-faced *Liocichla*** (*L. phoenicea*); the two were only recently split. All members of the genus are relatively small with distinctly square-ended tails, coloured wingpanels, prominent long rectal bristles and long hind claws; four of them have red outer edges at the tips of the tertials and secondaries, as seen here.

[*Liocichla ripponi ripponi*, Doi Lang, Chiang Mai, Thailand.  
Photo: Kanit Khanikul]

with *Micromacronus*. The Flame-templed Babbler (*Dasycrotopha speciosa*) has curious head-tufts which may project more in agitation.

Although not part of the plumage, mouth colour appears to be important in some species. It is yellow in Sharpe's Babbler (*Turdoides sharpei*) and black with a yellow tongue in the Brown Babbler (*Turdoides plebejus*). In the case of the Yellow-eyed Babbler, it is black in the breeding period but otherwise brownish. The extent of this condition and its function are, however, unknown.

Most babblers are what would be considered "normal" in proportions, but the trend towards a long, graduated tail reaches a climax with the Long-tailed Sibia (*Heterophasia picaoides*) and generally with the laughingthrushes, in which the character is all the stronger for the shortness of the wings. The Red-billed Leiothrix, however, has a forked tail and the *liocichlas* have a rather squared-off tail. As the tail becomes shorter, so the profile becomes more rounded and chunkier, as in the genera *Stachyris*, *Turdinus* and *Napothera*, and then stubby and wren-like, as in the almost tailless *Rimator* and *Pnoepyga*.

Variations in bill size are just as strong. Among species that take a variety of invertebrates, seeds and fruit, the bill is relatively simple, a generalist tool used mostly for probing, digging, flicking and plucking, although its size, of course, co-varies with the size of the bird itself. Others timaliids are more specialized, and the English names invoked to describe them now or in the past, "wren", "tit", "shrike" and "jay", reflect these adaptations. Certain laughingthrushes have a stout bill like that of a jay (*Corvidae*), used for hoarding and hammering acorns, and the anomalously stout bill of the Striated Laughingthrush may prove to serve a similar function. While many wren-babblers recall the wren genus *Troglodytes*, the analogy for *Rimator*, with its long and thin curved bill, is perhaps the cactus-wren genus *Campylorhynchus*. The *Pomatorhinus* scimitar-babblers, so aptly named, have for a bill a "scimitar" that resembles the bills of the New World *Toxostoma* thrashers; that of the closely related Sickle-billed Scimitar-babbler (*Xiphirhynchus superciliaris*) brings to mind a Neotropical woodhewer (*Campyloramphus*), although the former feeds mostly on the ground. The genus *Sphenocichla* has a conical bill like that of some of the caciques (*Cacicus*), and presumably utilizes it for chiseling. The short decurved bills of

*Myzornis* and the *Heterophasia* and *Malacias* sibilas are adaptations for nectar-feeding, and these timaliids have developed brush-tipped tongues as a consequence of this behaviour.

Differences between the sexes of babblers are mainly morphometric, with females almost invariably a little smaller than males, although this is only an average and there is plenty of overlap. Only about 8% of the 309 species in the present treatment of the family exhibit any sexual plumage differences, and some of these, such as the paler or duller underparts of females of *Lioparus* and *Micromacronus*, are minor. The genera *Cutia*, *Mesia*, *Leiothrix*, *Minla*, *Myzornis* and *Pteruthius* are well known for their fairly marked differences between the sexes, but the constantly warmer underparts of female *Spelaornis* babblers and the generally less pronounced colours of female *Liocichla* have been less often recognized, although a recent study of the Taiwan *Liocichla* (*Liocichla steerii*) has demonstrated that some differences show up spectographically. The Blue-winged Laughingthrush has the distinction of being the only "garrulacine" in which plumage dimorphism is apparent, the female being more rufescent on the face and having dark brown, rather than blackish, flight-feathers and tail. Among the "non-babblers" (see Systematics), *Achaetops* and *Chaetops* exhibit small differences between the sexes and *Mystacornis* shows large differences.

As already noted (see Systematics), it is one of the general taxonomic diagnoses of babblers that there is usually no distinct juvenile plumage. In some species, the similarities may be bewilderingly strong. For example, juvenile Grey-cheeked Fulvetta (*Alcippe morrisonia*) are so like the adults that, in one study of the species, the only reliable guide to ageing proved to be the degree of pneumatization of the skull in the period April–September, when the skulls of 93% of known juveniles were incompletely ossified and those of 93% of known adults were fully ossified, although adults tended to show redder eyes. Soon after fledging, however, juvenile timaliids can usually be distinguished in the hand from adults by their softer, less pointed flight-feathers, particularly the first primary. Even so, it is an exaggeration to suggest that there is no difference between adults and juveniles. The great majority of juveniles exhibit minor distinctions which reveal their age, most often simply being browner than their parents, and sometimes having slightly darker eyes. A notable example of more distinctive plumage is the rufous stain on

The **Red-tailed Minla**, sole occupant of the genus *Minla*, is a strikingly patterned timaliid with a warbler-like bill and creeper-like foraging behaviour. It extends from Nepal to Vietnam, occurring in all strata of montane evergreen forests, but most often found with mixed-species flocks in the canopy. It is weakly sexually dichromatic, the female having a more olive-grey mantle, and more yellowish fringing on the tail and wings, than the male (shown here).

[*Minla ignotincta*.  
Photo: Cyril Laubscher]



the head of immature White-hooded Babblers (*Gampsorhynchus rufulus*) and another is the occluding grey feathering of young Southern Pied Babblers, but these are rare instances.

Very limited data are available on the moult of the family. There is a post-juvenile moult, which starts some weeks or months after fledging. It is completed rapidly by the smaller species but much more slowly by larger ones, and adverse weather will cause it to be suspended. For example, Yellow-billed Babblers (*Turdoides affinis*) begin to moult three months after fledging, but, whereas individuals that fledge in the early part of the year are able to complete this moult, later-fledged ones cannot and, instead, undergo a complete moult in the following year. Similarly, in the case of Palearctic *Turdoides* babblers, early-hatched young complete the moult before winter, but later-hatched ones may replace only some flight-feathers and tail feathers before full suspension of the moult in the later part of the autumn. Adult Yellow-billed Babblers and Jungle Babblers (*Turdoides striata*) may nest and moult simultaneously, the body feathers being replaced from March to November and the flight-feathers from May to November. Similar extended moults occur in the Arrow-marked Babbler (*Turdoides jardineii*) in the Afrotropics. This may entirely reflect the piecemeal nature of the breeding cycle and the high number of renesting attempts that can be made. On the other hand, the moult of the Red-billed Leiothrix, at least in captivity, can be very fast and be completed in less than a month.

### Habitat

Forest, forest edge, scrub and grassland are the habitats of babblers. While the family can be said, therefore, to occupy a broad spectrum, from primary forest down to open climax vegetation below human eye level, which suggests a very plastic ecological adaptability, in reality the great majority of babblers appear, nevertheless, to be birds of dense thickety areas such as are found at treefalls or edges in standing forest or else, in drier open areas, in clumps of trees and bushes and tangles. The habitat occupied by members of this family has in many cases not been well defined, and for almost no timaliid species has it been quantified, so that the descriptions given in the literature often reflect very crude, broad impressionistic assessments of general usage, with little or

no precise indications of the key features to which the species are adapted. Some species are described as occurring simply in "forest", and, although most descriptions give considerably more detail than this, it is merely of an additive type. It is not that such accounts are inaccurate, but how helpful they are in indicating the species' true habitat preferences is open to query.

Nevertheless, if we break down these descriptions very crudely indeed into those which indicate habitat simply as (1) forest only, (2) forest, secondary growth and some or sometimes more open adjacent areas ("forest and edge"), (3) forest edge, young secondary growth, plantations and scrub ("forest edge"), (4) scrub and secondary growth ("scrub") and (5) tall grassland and scrub ("grassland"), we find that 22% of babblers are confined to forest, 10% to forest and edge, 56% to forest edge, 10%



The sibilas form a group of eight specialized nectarivores, six of which are currently placed in the genus *Malacias*. The **Rufous Sibia**, a delicately coloured inhabitant of Himalayan forests, is a typical example. It has a long graduated tail, the short legs of an arboreal passerine, and the slender decurved bill of a nectar-hunter. In terms of plumage, sibilas vary from black and white, to grey or rufous. Their taxonomic placement in the family is debatable, but preliminary results of genetic analyses suggest, rather surprisingly, that they may be most closely related to Leiothrix and Mesia.

[*Malacias capistratus bayleyi*,  
Hanuman Tok,  
Gangtok, Sikkim, India.  
Photo: Gaurav Bhatnagar]





The barwings are a well-defined group of seven Asian species in the genus *Actinodura*. The results of genetic analyses suggest a relationship with minlas. They resemble sibilas in size and tail length, but differ in the dense black barring on their wings and tails, erectile crown feathers, long rectal bristles, and shorter, deeper bills. Most barwings have brown plumage, with a varying amount of streaking, and a greyer head. They also tend to have pale eyerings, a trait expressed most conspicuously in the **Spectacled Barwing**.

[*Actinodura ramsayi*  
*ramsayi*,  
Doi Inthanon  
National Park,  
Thailand.  
Photo: Suppalak Klabdee]

to scrub and 2% to grassland. If we then allow that the plain use of "forest" seems frequently to be a default designation based on the simplest level of information or assumption, and we arbitrarily decide that half of such designations may in due course be reclassified under "forest and edge", then we can speculatively group all the species into a more general arrangement in which 11% are true forest species, 77% are broad edge-spectrum species, and 12% are scrub and grassland species. Time will tell whether this overemphasizes the basic ecological character of babblers, but generally it seems to reflect their specialization for foraging in dense, relatively low-level vegetation such as luxuriant thickets, regenerating edges, dense undergrowth and lower storeys, the often rather stout bill and legs being adaptations for moving about in the woodier, more sclerotic parts of the forest and taking wingless or immobile animal food from more solid substrates such as stems, branches, dead leaves and the ground (see Food and Feeding). If babblers are thus specialized on disturbed and secondary habitats, this may help to explain why so few of them are threatened (see Status and Conservation); and, if they occur also in forest canopy and dense grass, these appear to be relatively unsuccessful or narrowly specialized colonizations by species which still retain the skulking disposition of their thicket-dwelling forebears.

Among these slightly unusual babblers, those that occupy largely the upper strata of the forest are the five *Pteruthius* shrike-babblers, which are not, in any case, true babblers, the two cutia species, the two species of *Crociis*, the two *Micromacrus*, the three *Kupeornis* mountain babblers and, being partly nectarivorous, most of the *Yuhina* species, although some of the last-named habitually forage at lower levels and all are capable of doing so. The *Heterophasia* and *Malacias* sibilas are also partially dependent on nectar and use the undercanopy, as does the Rufous-backed Sibia (*Leioptila annectens*), although it is not known to take nectar and is more bound to moss-laden and lichen-covered branches. The Panay Striped Babbler (*Zosterornis latistriatus*) likewise exploits mainly the upper levels of the forest, although in moss forest this is presumably relatively low down. All of these species are montane, some shrike-babblers appearing at only 300 m but most doing so at much higher elevations, and all except the yuhinas specialize in foraging on the moss-laden and lichen-covered trunks and branches of the upper layers of the forest.

Those timaliids that largely occupy grassland areas include the *Chrysomma* species, which skulk in tall grass, reedbeds and tangled thickets, living in extensive tracts of habitat. Jerdon's Babbler (*Chrysomma altirostre*) is the most specialized in this regard, and has a strictly lowland distribution, whereas its sole congener, the Yellow-eyed Babbler, ranges higher, to around 1500 m, and the apparently closely related Rufous-tailed Babbler (*Moupinia poecilotis*) starts at 1500 m and continues to 3300 m, occasionally up to 3700 m. The Marsh Babbler is unusual in its genus, *Pellorneum*, for inhabiting reeds and tall grasses near water, and both the Striated Babbler (*Turdoides earlei*) and the Slender-billed Babbler (*Turdoides longirostris*) similarly occupy grassland, usually near water, as their major habitat type, although both retain the trait of their genus of using scrubby bushes and trees for nesting. Other *Turdoides* babblers use savanna and forage in grassy areas, but these are birds less of the grasslands than of the scrub and trees that dot the grasslands. Three anomalous southern African species in the genera *Achaetops* and *Chaetops* live in rocky and sometimes shrubby terrain in grassland areas, and may therefore crudely be considered "grassland" species.

Since bamboo is a type of grass, this is the appropriate place to mention three bamboo specialists in the family, although in the present classification they fall into the category of forest-edge species. These are the curious Golden-breasted Fulvetta (*Lioparus chrysotis*), which is usually found in bamboo although also in bushes bordering tracks; and the even more curious pair of *Gampsorhynchus* babblers, namely the White-hooded and Collared Babblers (*Gampsorhynchus torquatus*). *Lioparus* is montane in its distribution, *Gampsorhynchus* keeping to foothills and submontane areas. Other babblers that display a strong degree of association with bamboo, although no such relationship is an obligate one, are the Sickle-billed Scimitar-babbler, the Orange-billed (*Pomatorhinus ochraceiceps*) and Coral-billed Scimitar-babblers (*Pomatorhinus ferruginosus*), and the Golden-fronted Fulvetta (*Pseudominla variegaticeps*), again all submontane to montane species. Many other members of the family include bamboo in their habitat and at least occasionally use it or visit it.

Babblers that inhabit what is here loosely termed "scrub"—various vegetation types in which trees do not form continuous stands but, at best, occur in small clumps—are relatively few in number, and half of them belong to the genus *Turdoides*, sug-

Apart from the fact that it is incontrovertibly a babbler, the evolutionary origins of the **Fire-tailed Myzornis** remain obscure. It may be derived from the small, bright species in the *Leiothrix*-*Minla*-*Siva* group, or it may be related to *sibias*, with which it shares a foraging specialization (nectarivory) and a related adaptation (decurved bill). The sole member of the genus *Myzornis*, it roams in small flocks through mossy scrub, bamboo, and low forest in the Himalayas of Nepal, northern India, Bhutan, south China and north Myanmar, occasionally ascending above 4000 m.

[*Myzornis pyrrhura*,  
Dochula, Buthan.  
Photo: Yeshey Dorji]

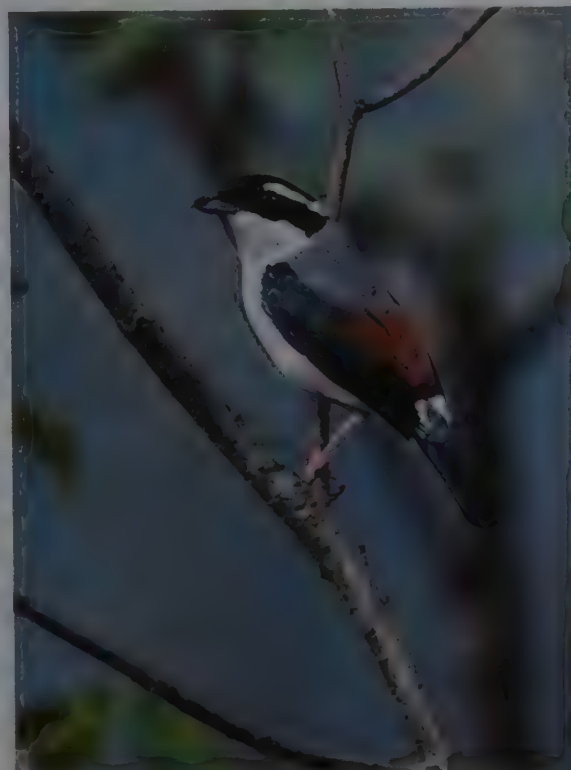


gesting that this type of habitat does not greatly favour birds with the limited vagility of the Timaliidae. Four monotypic genera, *Chamaea*, *Dumetia*, *Timalia* and *Rhopophilus*, are among them. Each of these four is difficult to characterize. The Wrenit basically requires low brush and scrub, but this can occur independently of any trees as well as inside many different types of open wooded landscape. The Tawny-bellied Babbler (*Dumetia hyperythra*) is rather similar, using low scrub and grass but seeming to need a certain amount of taller cover. The Chestnut-capped Babbler (*Timalia pileata*) occupies an intriguing range of open habitats, from swampy reeds and grasses to bamboo, thorn hedges, brushwood and palm bushes in mangroves. The last of the four, the Chinese Bush-dweller, utilizes scrub, bushes, grass and reeds. A fifth species, the Spot-throated Babbler (*Pellorneum albiventris*), an odd *Pellorneum* closely related to the Marsh Babbler, uses scrub, grass and pine-forest undergrowth. The bush-dweller's elevations are not well documented, but the other four range from sea-level to between 1500 m and 2300 m. All five species are small-bodied in comparison with the rest in this habitat group.

Ten laughingthrushes fall into the scrub-dwelling category. The Masked Laughingthrush, which occupies scrub, thickets, bamboo, reeds and hedges from the lowlands to 1000 m, is the only member of the genus *Garrulax* to do so, while the other nine are divided among three genera which exploit exclusively this habitat. The Chinese Hwamei and the Taiwan Hwamei (*Leucodioptron taewanum*) favour clumps of secondary growth, thickets, bamboo, tall grass and sometimes gardens, from the lowlands to 1200–1800 m. The five small *Strophocincla* laughingthrushes inhabit streamside thickets, wooded gardens, bushy field margins and forest edge at middle elevations, roughly 1000–2500 m. Both of the *Pterorhinus* species occupy willow (*Salix*) scrub, grass, thickets, brushwood and dwarf open forest, at varying elevations, the White-browed Laughingthrush (*Pterorhinus sannio*) from low foothills to 2600 m and the Plain Laughingthrush (*Pterorhinus davidi*) at 1600–3300 m.

This, then, leaves a large number of *Turdoides* babblers as "scrub"-dwellers, birds that occupy dry thorny open country from semi-desert with palm groves and date gardens to open savanna and scrubby hillsides with boxthorn (*Lycium*) and acacia (*Acacia*), tamarisk (*Tamarix*) and *Ziziphus* clumps. They include the Spiny, Iraq (*Turdoides altirostris*), Common (*Turdoides caudata*), White-throated (*Turdoides gularis*), Large Grey (*Turdoides*

*malcolmi*), Arabian (*Turdoides squamiceps*), Fulvous, Bare-eyed, Rusty, Sharpe's, Arrow-marked, Scaly (*Turdoides squamulata*), Northern White-rumped (*Turdoides leucopygia*), Southern White-rumped (*Turdoides hartlaubii*), Hinde's Pied (*Turdoides hindei*) and Northern Pied Babblers (*Turdoides hypoleuca*). While the Spiny Babbler occurs at 915–2135 m, Hinde's Pied Babbler at 1070–1700 m, the Northern White-rumped Babbler at 1250–2450 m and reaching to the foothills in Eritrea, and the Northern Pied Babbler at 1000–1800 m, the others range down to sea-level. At the other extreme, the Arabian Babbler ascends to 2800 m in



Recent molecular work has shown that the *Pteruthius* shrike-babblers are not babblers at all, and belong instead to the corvid lineage. Genetic data further suggest that they are so close to the vireos (*Vireonidae*) of the New World that they should be included within that family. While this discovery is startling from a biogeographical and morphological perspective, it is less surprising from the viewpoint of voice and behaviour as species like the **White-browed Shrike-babbler** do indeed act and sound vireo-like. This is a common treetop species across much of Asia from Pakistan to Java and Borneo.

[*Pteruthius flaviscapitis*  
*validirostris*,  
near Gangtok, Sikkim.  
Photo: John Holmes/FLPA]





**The White-bellied Erpornis**, previously placed in Yuhina, is another widespread Asiatic form that has been shown to be misplaced in Timaliidae, and more accurately allied with the Vireonidae. Sole member of the genus Erpornis, it has a slender bill, a relatively prominent crest, a square-ended tail, and rather weak legs and feet. In its foraging behaviour and vocalizations it is somewhat reminiscent of tits (Paridae). Fairly common in the middle strata of humid forests, it occurs from Nepal to Sumatra and Borneo, ranging from the lowlands to the montane zone, and occasionally reaching 3500 m.

[*Erpornis zantholeuca* tyrannulus, Phu Khieo Wildlife Sanctuary, Thailand. Photo: Suppalak Klabdee]

Yemen, much higher than any other *Turdoides* babbler, the next highest elevation being reached by the Northern White-rumped, at 2450 m.

Species that seem most simply characterized as forest-edge inhabitants comprise those that occupy glades and light-gaps, range out into more open country and are reported also, at least marginally, from forest itself, but with the main emphasis and evidence falling on edge habitats, which here include also secondary and recovering forest, gallery and riverine forest, and plantations such as coffee and timber trees. In the Timaliidae, such species are represented by a wide range of genera and well over half of all members of the family. In Africa, this involves both species of *Pseudoalcippe*, most, if not all, of the *Illadopsis* species, seven *Turdoides* and the monospecific genera *Lioptilus*, *Paraphasma* and *Horizorhinus*.

One of these species, the Scaly-breasted Illadopsis (*Illadopsis albipectus*), is perhaps the only babbler to have been the subject of detailed quantitative analysis of habitat selection. This study, carried out by J. A. Lindsell in Budongo Forest, in Uganda, generated some very interesting insights. The species preferentially forages in and adjacent to treefall gaps in natural forest, probably because the decaying wood within the gaps is associated with a higher biomass of leaf-litter invertebrates, on which the birds mainly feed, although this is true also in man-made light-gaps where fallen timber is usually removed. Territory density increases with the number of light-gaps, so that the highest densities are found in forest that has been well logged. Intriguingly, however, while individuals having home ranges with a higher number of treefall gaps are in better body condition than are others, they also experience a greater squeeze during the main annual dry season. Because it is more open, the understorey of logged forest is subject to more extreme seasonal abiotic conditions, and in the dry season becomes lighter, hotter and less humid than does unlogged forest, food being accordingly less easy to find. Another member of the genus, the Brown Illadopsis (*Illadopsis fulvescens*), is interesting not only for being able to use pure stands of arrowroot (Marantaceae), but also for having a strong requirement for primary forest in the Lower Guinea forests while readily tolerating disturbed and logged forest in the Upper Guinea region.

This difference in tolerance on a broad geographical scale appears to have been recorded for only one other babbler, the Crimson-faced Liocichla. Like all other species in its genus, this is essentially a bird of edge habitats at middle elevations, but in Bhutan, and presumably throughout the westernmost reaches of its range, it occurs only in extensive tracts of untouched broadleaf forest. It is perfectly possible, of course, that similar conditions apply among other species but have not yet been registered by ornithologists. Another species, the Orange-billed Babbler of south-west Sri Lanka, has a curious trait of seeming to be restricted to primary forest in some areas while entering secondary areas, scrub and tea plantations in others; this and the Jungle Babbler are the two Asian *Turdoides* that qualify as "forest-edge" species as defined here.

Three of the six genera confined to the Philippines, *Dasycrotapha*, *Sterrhoptilus* and *Zosterornis*, consist largely of forest-edge species, although the Panay Striped Babbler is perhaps better classified as an undercanopy forest bird (see above). The Golden-crowned Babbler has been reported as preferring forest with more than 90% canopy cover but with a dense understorey covering up to 90% of the forest floor, suggesting that this species is, in fact, a treefall-gap specialist, which in the present treatment counts as forest-edge habitat. *Dasycrotapha* and *Sterrhoptilus* species cover elevations from around 100 m to well past 1000 m. *Zosterornis* taxa are typically found higher up, mainly or exclusively above 1000 m, the Chestnut-faced Babbler (*Zosterornis whiteheadi*) ranging occasionally down to 100 m but becoming abundant above 1400 m in moss forest, which has the general broken-canopy, heavily tangled character of forest edge.

Members of the genus *Macronus*, which has three species represented in the Philippines but is chiefly Sundaic in range, also occupy forest-edge habitats, as do the mainly Sundaic genera *Malacocincla* and *Trichastoma*. *Macronus* species have lowland distributions, although one reaches as high as 1700 m, but upper elevational limits in all cases may reflect attenuated populations and probably the highest densities all occur well below 1000 m. This is true of *Malacocincla* and *Trichastoma*, too, the highest record of the former also being at 1700 m, and that of the latter at 1900 m. These species' dependence on disturbed for-

est areas has allowed them also to colonize low-stature climax forest such as peatswamp-forest, upland and coastal heath-forest, mangroves and nipa palm (*Nypa*) swamps. The White-chested Babbler (*Trichastoma rostratum*) is perhaps the most specialized of them, being very largely a bird of forested riverbanks.

Babblers in *Pellorneum* and *Malacopteron*, two genera taxonomically and distributionally closely associated with *Malacocincla* and *Trichastoma*, being similarly plain and brown in basic coloration, mainly lowland in elevational range, and preponderantly Sundaic albeit extending well to the north and west, are similar to each other in ecology. Apart from the two anomalous species in grassland and scrub, respectively, *Pellorneum* consists of babblers which are clearly main users of forest-edge habitats, although at least one species, the Black-capped Babbler (*Pellorneum capistratum*), reacts badly to the fragmentation of its forest habitat. *Malacopteron*, on the other hand, combines obvious forest-edge species such as the Sooty-capped Babbler (*Malacopteron affine*) and Melodious Babbler (*Malacopteron palawanense*) with ones that appear to prefer less disturbed formations, namely the Moustached Babbler (*Malacopteron magnirostre*), Scaly-crowned Babbler (*Malacopteron cinereum*) and Rufous-crowned Babbler (*Malacopteron magnum*).

*Stachyris* is a further genus largely tied to the Sundaic lowlands, but, as with *Malacopteron*, it contains both forest-edge and forest-interior species, as well as ones that appear to bridge both habitat types. The most anomalous *Stachyris* in terms of plumage—the primary feature of which is its lack of plumage characters—is also the most specialized. This is the Sooty Babbler, which is one of two timaliids, the other being the Limestone Wren-babbler (*Gypsophila crispifrons*), confined to forest growing on limestone outcrops, although a third species, the Streaked Wren-babbler, is commonly, but not always, found in such areas. A second apparent specialist is the White-necked Babbler (*Stachyris leucotis*), which is believed to be confined to forest on slopes throughout its range, although nowhere reaching above 1000 m. In contrast, at least five species have frequently been recorded in old rubber and/or *Albizia* plantations, and evidently qualify as forest-edge inhabitants. These are the Black-throated Babbler (*Stachyris nigricollis*), Grey-headed Babbler (*Stachyris poliocephala*), Grey-throated Babbler (*Stachyris nigriceps*), Chestnut-winged Babbler and Chestnut-rumped Babbler (*Stachyris maculata*), and it seems likely that all the other members of the genus fall into this category, although one, the White-

bibbed Babbler (*Stachyris thoracica*), is not sufficiently well known to be described as other than a forest species. With regard to any assumptions about these birds' ability to survive away from forest, however, an interesting and potentially important proviso is supplied by the White-breasted Babbler of Java. This species has been found to occur in highly disturbed areas, including the edges of damar (*Agathis*) plantations, but it seems to do so only when these are adjacent to primary forest.

Among the other small babblers that can be categorized as forest-edge species are five of the seven *Alcippe*, all three *Schoeniparus*, the closely related monospecific *Rhopocichla*, all four *Stachyridopsis* and three of the four *Pseudominla* species. Grey-checked, Nepal (*Alcippe nipalensis*), Black-browed (*Alcippe grotei*), Brown-cheeked (*Alcippe poiocephala*) and Brown Fulvetta (*Alcippe brunneicauda*) occupy forest, secondary growth, bamboo and scrub, the first two with a fairly broad elevational range of 200 m to at least 2500 m, the second two confined below about 1500 m; in parts of Indochina, the Black-browed Fulvetta is segregated altitudinally from the higher-ranging Mountain Fulvetta (*Alcippe peracensis*). *Schoeniparus* fulvettae are undergrowth-dwelling birds of primary forest, but extending through secondary and disturbed formations out into bamboo, scrub and old cultivation. The Dark-fronted Babbler (*Rhopocichla atriceps*) of south-west India and Sri Lanka, although geographically very restricted, nevertheless favours a wide range of habitats below 2100 m, including forest undergrowth, secondary growth, plantations, marshy thickets, scrub, reeds and bamboo. *Stachyridopsis* babblers are very similar to each other not only in appearance and structure, but also in elevational range and habitat, being found in undergrowth and up to the middle storey in open forest, thick secondary scrub jungle, bamboo, bramble (*Rubus*) and lantana (*Lantana*) thickets and overgrown cultivation. This means that, like the Chestnut-faced Babbler on the Philippine island of Luzon, the Golden Babbler (*Stachyridopsis chrysaea*) in Sumatra can penetrate upper montane primary vegetation, while on the latter island the Rufous-fronted Babbler (*Stachyridopsis rufifrons*), which may prove to be a slope specialist, has been suggested as having a particular association with bamboo. Glades, streamside vegetation, cut-over scrub and bamboo all feature in habitat descriptions of the *Pseudominla* species with the exception of the Black-crowned Fulvetta (*Pseudominla klossi*), which in fact occupies the same habitat as the Rufous-winged Fulvetta (*Pseudominla castaneiceps*).

The South African genus *Chaetops* contains two species, one of which is the **Cape Rockjumper**.

These forms have long been postulated to be babblers because of the loose, copious body plumage, particularly on the rump. This clue was misleading, however, as genetic analyses have recently shown a link with the picathartes (*Picathartidae*) of West Africa. It is now commonly thought that rockjumpers are sufficiently distinct in structure, breeding biology and rock-dwelling habits to warrant a separate family of their own, *Chaetopidae*.

[*Chaetops frenatus*,  
Rooiels,

30 km E of Cape Town,  
South Africa.

Photo: Warwick Tarboton]





The widespread Asian genus *Pomatorhinus* consists of classic forest-edge species, with a typical range of habitats from forest understorey out into bamboo, scrub, bramble thickets, overgrown clearings, abandoned cultivation and long grass. Only one species of the 14 in the genus appears to be stricter in its niche: the Coral-billed Scimitar-babbler, while using both bamboo and wild banana groves, and even though preferring light gaps, is limited, at least in Bhutan, to more continuous tracts of forest, shunning fragmented areas. In Bhutan, the Streak-breasted Scimitar-babbler (*Pomatorhinus ruficollis*) remains more inside forest at lower elevations, where it overlaps with the Rusty-cheeked Scimitar-babbler (*Pomatorhinus erythrogastrus*), but at higher elevations it emerges into scrub and open conifer forest. Most species in this genus have an elevational range of around 2000 m, starting at or near sea-level, but the Spot-breasted Scimitar-babbler (*Pomatorhinus maclellandi*) is restricted to a belt at 750–1830 m and the Indian (*Pomatorhinus horsfieldii*) to one at 915–2135 m, while the Streak-breasted Scimitar-babbler is found within altitudinal zones of varying widths in various places, the widest by far being in China, where it ranges from 200 m to as high as 3400 m. The Large Scimitar-babbler (*Pomatorhinus hypoleucos*) is generally a bird of lower-lying areas at up to 1500 m in the majority of its large range, but it is strictly montane in southernmost Thailand and Peninsular Malaysia, where it is found at 915–2135 m. The Chestnut-backed Scimitar-babbler (*Pomatorhinus montanus*) makes a similar shift between, on the one side, Peninsular Malaysia and Sumatra, where it occurs from sea-level to 1350 m, and, on the other, Java and Borneo, where its respective limits are 1400–2000 m and 500–2800 m. Already mentioned as a possible bamboo specialist, the closely related Sick-billed Scimitar-babbler, a species in its own genus, seems also, from its use of dense undergrowth and shrubbery in and near forest, to be classifiable as a forest-edge bird.

Certainly the tiny wren-babblers of the genera *Spelaornis*, *Elachura* and *Pnoepyga* are all inhabitants of forest edge, an inevitable condition of being adapted to foraging on the ground in dense low vegetation—small-stature birds for small-stature habitat. They are found in dense undergrowth on steep terrain, usually near running water and/or roads and tracks where naturally occurring breaks in the canopy are matched by broken ground with moss-covered boulders, rocks and fallen trees intermixed with luxuriant ferns, bracken (*Pteridium*), bamboo, often of dwarf type, and a rich herb layer often with *Strobilanthes* and nettles (Urticaceae). One species, the Tawny-breasted Wren-babbler

(*Spelaornis longicaudatus*), even penetrates treeless areas on hillsides. The 13 species contained in these three genera have elevational ranges that vary between 900 m and 1900 m in width, all except two of them starting at 1000 m or above. The exceptions are the Spotted Wren-babbler (*Elachura formosa*), the lowest breeding altitude of which is 300 m, and the Pygmy Wren-babbler (*Pnoepyga pusilla*), which, as the Chestnut-backed Scimitar-babbler, exhibits an upward shift through the Indonesian archipelago, breeding above 750 m in South-east Asia, above 900 m in Sumatra, from 1300 m on Java, from 900 m on Flores and above 1800 m on Timor.

Other small montane species that qualify as birds of forest edge are the attractive monospecific genera *Chrysominla*, *Mesia*, *Leiothrix*, *Siva* and *Myzornis*, although there are important differences between some of them. The Bar-throated Minla is mostly a canopy-dwelling bird when in forest, but it ranges down through open low-stature birch (*Betula*), willow and barberry (*Berberis*) woodland into bushy open country. The Silver-eared Mesia (*Mesia argentea*) is rather more confined to forest, although it does extend into heavily man-modified terrain such as abandoned tea and other plantations; in Bhutan, on the other hand, it appears to be a light-gap specialist in continuous forest, not occurring in extensive edge habitats. The Red-billed Leiothrix requires open forest with a berry-bearing shrub layer, forest edge, abandoned fields and bamboo. The Blue-winged Siva is very similar to the leiothrix in its needs, but it also occupies *Fokienia* forest in Indochina. Completing the list, the Fire-tailed Myzornis, a flower specialist, inhabits oak-rhododendron (*Quercus-Rhododendron*) forest, rhododendron and juniper (*Juniperus*) scrub, bushes and bamboo. Each has an elevational range covering at least 1500 m, the lowest, *Mesia*, typically starting at 600 m, and the highest, *Myzornis*, at 2000 m.

Three of the seven species of barwing clearly qualify as forest-edge species. These are the Rusty-fronted (*Actinodura egeroni*), Spectacled (*Actinodura ramsayi*) and Black-crowned Barwings (*Actinodura sodangorum*), the last only recently described. All three inhabit dense undergrowth, shrubbery, bamboo, tall grass and scrub in forest and secondary growth, and all three occur at rather lower elevations than do the four that are less obviously edge species. In Bhutan it has been observed that, in the belt where they overlap, the Hoary-throated Barwing occupies the canopy and the Rusty-fronted the bushes and undergrowth, but that, in places where one of the two is absent, the niches of the other species tend to expand more.



One behavioural trait found repeatedly throughout the family is that of group-living. Most babblers are at least seasonally gregarious, and many live in extended family groups all year round. The Grey-throated Babbler, for example, forages in parties of 5–20 individuals in the non-breeding season, often in association with other timaliids. These groups are generally furtive, but will emerge to scold an intruder with loud alarm calls, or when boisterous squabbling breaks out.

[*Stachyris nigriceps borneensis*, Mount Kinabalu National Park, Sabah, Borneo. Photo: Ong Kiem Sian]

Laughingthrushes are classic timaliids in their gregarious habits and group territoriality. They tend to forage in closely knit pairs or small parties, as is the case of the **Red-tailed Laughingthrush**. The soft, scalloped grey of the body plumage, and the rich ochre and maroon of the crown and tail, make it one of the most stunningly beautiful of babblers. This photograph, taken in captivity, captures these attractive features, but not the true character of the species. It is a shy South-east Asian bird, rarely emerging into the open, preferring to forage close to the ground, or amongst the leaf litter, in the shady understorey of montane evergreen forests.

[*Trochalopteron milnei*.  
Photo: Cyril Laubscher]



A slightly different phenomenon, also in Bhutan, has been noticed in respect of two species of *Garrulax* laughingthrush. In this case, there appears to be no habitat-partitioning but merely species replacement or numerical suppression, the White-throated Laughingthrush being supplanted at lower elevations by the White-crested Laughingthrush, with the effect that, in an area where the latter is absent, the former is common. This is interesting because, although both species commonly forage on the ground, the White-throated is as much a bird of the middle storey. Moreover, while the White-crested Laughingthrush certainly counts as a forest-edge species—something that one must assume also for the closely related but little-known Black-and-white Laughingthrush of Sumatra—the White-throated Laughingthrush is generally somewhat more an inhabitant of forest interior, falling in the habitat category of “forest and edge”.

Forest-edge laughingthrushes involve at least nine genera. At lower elevations, the White-crested, Greater Necklaced and Lesser Necklaced Laughingthrushes (*Garrulax monileger*) represent all *Garrulax* in this category, and these three species often co-occur from forest through to bamboo and scrub, and from sea-level to very roughly 1800 m. The five species to which these three are most closely related are, however, so far as can be judged, better treated as forest-interior birds with elevational ranges rather more straitened, since they begin in the foothills between 400 m and 800 m and all terminate at or below 1800 m: they are the Rufous-cheeked, Grey (*Garrulax maesi*), Black-hooded (*Garrulax milleti*), Cambodian (*Garrulax ferrarius*) and White-necked Laughingthrushes (*Garrulax strepitans*). In contrast, the six non-singing, non-laughing but highly sociable relatives in *Dryonastes* all occupy forest-edge habitats, albeit with broadly similar elevational ranges, none higher than 2000 m. These are the Rufous-vented (*Dryonastes gularis*), Wynaad, Blue-crowned (*Dryonastes courtoisi*), Yellow-throated (*Dryonastes galbanus*), White-cheeked (*Dryonastes vassali*) and Rufous-necked Laughingthrushes, all typically found in such places as forest undergrowth, bamboo jungle, secondary growth, scrub and the borders of cultivation, the last-named even spreading out into

tall grass and reeds, often along streams, brambles, hedgerows and tea gardens.

The four species in the two Sundaic genera *Rhinocichla* and *Melanocichla* show mixed evidence of being forest-edge birds, the former being the more obviously so. In Peninsular Malaysia and Sumatra, the Spectacled Laughingthrush (*Rhinocichla mitrata*) occupies forest, edge, low growth and overgrown fields from 900 m or lower up to 3200 m, and in Borneo the Chestnut-hooded Laughingthrush (*Rhinocichla treacheri*) exploits similar habitat in an even wider elevational range, from 200 m to as high as 3350 m. The Black Laughingthrush (*Melanocichla lugubris*), which shares its range with the Spectacled, and the Bare-headed Laughingthrush (*Melanocichla calva*), which shares its with the Chestnut-hooded, are more limited in elevation, with extremes of 500 m and 1800 m, and seemingly also in habitat width, utilizing the lower and middle storeys of forest, including secondary disturbed forest, the former, at least, occurring also in edges and at light gaps. Perhaps *Melanocichla* is a timaliid more of forest interior, as its dull coloration would seem to imply.

At broadly similar elevations to those used by *Melanocichla* are the closely related pair of *Stactocichla* laughingthrushes, both of which skulk deep inside understorey shrubbery, edges, light gaps and densely overgrown fields and borders, and the two closely related members of *Strophocincl*a in southern India, both of which occupy thickets, scrub and overgrown edges of plantations, and one of which, the Kerala Laughingthrush (*Strophocincl*a *fairbanki*), is thought to have its range circumscribed by that of the wild raspberry (*Rubus*). The remaining three *Strophocincl*a, all in the north of the Indian Subcontinent, have higher-lying ranges, two with upper limits at 2400 m and one at 3000 m, and occupy thick scrub, bushes and grass, as well as more obviously anthropogenic habitats such as field borders, gardens and other areas around human settlements.

Also to be found in patches around mountain villages are the Moustached Laughingthrush (*Lanthocincl*a *cineracea*), Rufous-chinned Laughingthrush (*Lanthocincl*a *rufogularis*) and Spotted Laughingthrush and the anomalous Striated Laughingthrush. The



first avoids primary forest, the second actively profits from shifting cultivation, and the third enters scrub bordering fields. The fourth is a bird of the middle storey and lower canopy in forest, but it also extends into scrub jungle, thickets and bamboo clumps, mainly at 1000–3000 m; in Bhutan, this upper limit coincides with the distribution of cool broadleaf forest. Vaguely similar in appearance to the Striated Laughingthrush, the three species of babax (*Babax*) range much higher, well above 4000 m, and are adapted to life on the ground and in the lower strata of montane and alpine vegetation such as stands of juniper, willow, sea-buckthorn (*Hippophae*) and prickly oak, scrub, brambles, bracken and grass. These birds, some of the largest of all babblers, must therefore find themselves sometimes in the fleeting company of some of the smallest in the family, as the White-browed (*Fulvetta vinipectus*), Ludlow's (*Fulvetta ludlowi*) and Grey-hooded Fulvetta (*Fulvetta cinereiceps*) all occupy bushes, scrub, juniper, dwarf willow, birch, stunted rhododendron, brambles and bamboo at upper elevational levels near the tree-line, as well as using taller forest.

This huge group of forest-edge species is completed by 14 members of the genus *Trochalopteron*, some of which rival the babaxes for the distinction of being the highest-elevation babblers in the world. The Brown-cheeked (*Trochalopteron henrici*), Elliot's, Variegated (*Trochalopteron variegatum*) and Black-faced Laughingthrushes (*Trochalopteron affine*) all reach over 4000 m, the last-named attaining 4600 m, the same as the Giant Babax, and at these upper limits all are tree-line species of upper forest edge, pushing into scrub and bushes in sheltered gulleys. None of the 14 species occurs normally below 900 m, and almost all of them are typically associated with forest and edge, bamboo thickets, shrubbery, scrub and clearings. The Red-tailed Laughingthrush (*Trochalopteron milnei*) presents an interesting example of a species which in one country, in this case Thailand, is known to utilize scrub but in an adjacent one, Laos, is instead a denizen of continuous hill evergreen forest.

The final two members of *Trochalopteron* separate into the final two habitat categories, those of "forest and edge" and "forest", although, as noted already, the distinctions are clearly weak and highly dependent on reports in the literature and their interpretation. One is the Scaly Laughingthrush (*Trochalopteron subunicolor*), which inhabits broadleaf forest, dwarf rhododendron and bamboo. The other is the newly discovered Golden-winged Laughingthrush (*Trochalopteron ngoclinhense*), which

has to date been recorded only in the understorey of relatively low-stature primary montane forest, an interesting circumstance, given that its close relatives in the Chestnut-crowned Laughingthrush (*Trochalopteron erythrocephalum*) complex all use forest-edge habitats.

"Forest and edge" species are defined as those which appear to be able to use either habitat, but which are not clearly identified as having a variety of non-forest habitats into which they might spill from taller adjacent edge cover. They are very considerably fewer in number. In addition to the two *Trochalopteron* mentioned above, this category contains the four remaining *Actinodura* barwings and the five remaining *Ianthocincla* laughingthrushes, at least two of which, the White-speckled (*Ianthocincla bieti*) and Giant Laughingthrushes, reach elevations above 4000 m but appear nonetheless to be confined within forest. All eleven yuhinas in the genera *Yuhina* and *Staphida* and the non-yuhina *Erpornis* occupy such habitat, in all cases involving broadleaf evergreen forest even at higher elevations, three species ascending above 3500 m, although some conifer stands are then also used. In a recent study of the Taiwan Yuhina, 83.5% of nests were within woodland, rather than in orchards or adjacent open habitats, but these nests were closer to the woodland edge than would be expected from chance placement. The Black-crowned (*Sterrhoptilus nigrocapitatus*) and Rusty-crowned Babblers (*Sterrhoptilus capitalis*) are two representatives of their genus that seem to be less "edge-restricted" than are the others, and elsewhere in the Philippines both species of *Micromacronus* appear, from what little is known about them, to be birds of the canopy and undergrowth of forest and forest edge, as do the two *Robsonius* and the single *Leonardina* species, forest-floor specialists for which edge habitats may often be vital. The Black-headed (*Malacias desgodinsi*) and White-eared Sibilas (*Malacias auricularis*), which occupy elevations between very roughly 1000 m and 3000 m, inhabit both evergreen forest and edge, and in Africa the monospecific *Phyllanthus* is similar, albeit extending out into savanna and occasionally visiting gardens, but always keeping to the darkest areas.

African timaliids that seem confined to forest and woodland are the Thrush-babbler, which skulks in dense vegetation along streams in forest, gallery forest, damp woodland and thickets, and the Black-capped Illadopsis (*Illadopsis cleaveri*), which lives in the understorey of primary and secondary forest, swamp-forest and sometimes coffee groves. Afrotropical species of "non-babbler"



**The Southern Pied Babbler** is a good example of a well-studied gregarious timaliid. It is usually found in groups of up to 15 birds, often including 6–10 adults and up to three immature birds. These gatherings collaborate to defend large territories of 35–50 ha in African acacia savanna. They breed co-operatively, with up to 12 helpers at the nest. In all seasons, Southern Pied Babblers commonly form foraging associations with other species, including Red-billed Buffalo-weavers (*Bubalornis niger*), Crimson-breasted Shrikes (*Laniarius atrococcineus*) and Fork-tailed Drongos (*Dicrurus adsimilis*).

[*Turdoides bicolor*, Etosha National Park, Namibia.  
Photo: Günter Ziesler]

(see Systematics) that are likewise forest-bound are the Grey-chested Kakamega, which is rather like the Thrush-babbler in its preference for shaded streamside areas, albeit at higher elevations, the Spot-throat, which favours luxuriant wet montane forest of regionally variable type and has been recorded in forest edge, and the Dapple-throat, which favours similar forest but with areas of open floor enclosed by dense herbs and shrubs. The Madagascar Groundhunter dwells in the forest undergrowth and understorey, foraging in the leaf litter and on moss-covered trees and rocks.

The species just mentioned are all birds of the forest floor, which explains why they are not greatly recorded in edge habitats. In Asia, the same considerations largely apply. Here, there are 35 species in twelve genera that occupy the floor and/or the lower understorey in extensive forest tracts, with eight species in four genera typically in the middle storey. Among the ground-dwellers is a group of apparently closely related species representing the entire genera *Kenopia* (one species), *Ptilochila* (three), *Turdinus* (four), *Napothera* (three) and *Rimator* (four), all of which typically forage among leaf litter, on rotten fallen timber, amid rocks and around trunk bases, often in the vicinity of streams and gulleys but not necessarily with an open or broken canopy. There is little or no solid evidence for more precise habitat preferences, but the Large Wren-babbler is said to favour areas of the undergrowth dense with rattan (Calameae), salak palm (*Salacca*), bamboo and gingers, and this may well be true of several of the other species. Some are lowland timaliids, found below 1000 m, but most are also montane and *Rimator* is predominantly montane.

Other species in this list, while using the forest floor for foraging, make use also of other strata. The two *Sphenocichla* "wedge-billed" babblers are relatively arboreal, and three members of *Dryonastes* and eight of *Garrulax* will commonly forage on the ground but also in the middle storey, but all appear to be forest birds with no evident preference for edge habitats. One of the three *Dryonastes* that form a distinct group of "soft-plumaged" species, the Grey-sided Laughingthrush, has been thought in Bhutan to prefer dense stunted broadleaf forest on steep slopes with some bamboo, and it may be that similar parameters govern the occurrence or abundance of the other two, the Chestnut-winged and Rusty Laughingthrushes; on the other hand, the Grey-sided Laughingthrush occurs at higher elevations than these others, so that its preferences in Bhutan may have no bearing on those of its close relations at lower elevations elsewhere. The five mainly

Indochinese forest *Garrulax*, namely the Rufous-cheeked, Grey, Black-hooded, Cambodian and White-necked Laughingthrushes, feed largely on the floor in submontane broadleaf evergreen forest, using the middle storey when moving between foraging sites; all occur at reasonably similar elevations, from an average of 600 m up to 1600 m. Three other forest-dwelling species of *Garrulax*, the Rufous-fronted, Ashy-headed and Sunda Laughingthrushes, are essentially similar, although the Ashy-headed is more lowland in distribution while the other two ascend above 2000 m, and all three may possibly forage arboreally more than terrestrially.

There are eight species of "forest" babbler that habitually use the middle storey. The five *Malacopteron* babblers, birds of extreme lowlands, do so, although two are treated above as forest-edge birds. So also do two closely related *Garrulax* of montane elevations, the White-throated Laughingthrush, already mentioned for its apparent interactions with the White-crested in Bhutan, and, on Taiwan, the Rufous-crowned Laughingthrush, although both of these commonly forage on the forest floor. The Red-tailed Minla (*Minla ignotincta*) seems to be more a bird of the forest interior and, indeed, less of a canopy-dweller than is the Bar-throated Minla. Finally, it remains very unclear what kind of bird the Malia is, but this species, too, appears to be an inhabitant of the middle storey within forest. Like the Javan babblers mentioned in the preceding paragraph, however, it is so little known that its ecological classification is as uncertain as its taxonomic position.

### General Habits

Babblers are for the most part highly sociable species, and many of their habits and activities are determined by this trait. In a very crude review of the evidence, and always accepting that some species are not strictly timaliids (see Systematics), around 64% of the 309 species in the current treatment live in groups outside the breeding season, 14% live in groups throughout the year, and 13% appear to live mainly in pairs although, for some of the time, in small family parties. The remaining 9% are not sufficiently well known for the category in which they belong to be determined with any degree of certainty.

The presumption behind the figure of 64% is that these are species, almost 200 of them, which do not live simply in family parties but in flocks, variable in size through the year, formed by

Allopreening is a form of behaviour found almost ubiquitously amongst the true babblers. It appears to be an innate and fundamental type of comfort behaviour, especially as solitary captive babblers of more than one species have been seen to solicit allopreening by wing-drooping, head-raising and erecting of the feathers on the head and neck.

It seems to be most prevalent in species which live permanently in pairs or groups, and perhaps serves to strengthen bonds between individuals. In gregarious species, such as the Chestnut-backed Scimitar-babbler, a pause in foraging often leads to bouts of group preening.



[*Pomatorhinus montanus*.  
Photo: Brian J. Coates]





One offshoot of group-living is known as "clumping". This behaviour is frequently observed in social species, including waxbills (Estrildidae), certain cuckoos (Cuculidae), and babblers, especially *Turdoides*. It arises during periods of rest, or at nocturnal roosts, often beginning with one individual sidling up to another on a perch. This leads to more individuals joining the clump, with increasing enthusiasm, until the whole group is huddled together. Clumping is regularly accompanied by allopreening-solicitation and reciprocal allopreening, as demonstrated by this group of Jungle Babbler.

[*Turdoides striata striata*, Keoladeo Ghana National Park, Bharatpur, India. Photo: Otto Pfister]

the amalgamation of families. For example, the numbers of individuals in flocks of Grey-cheeked Fulvetas in Taiwan reach a peak in August, presumably when all the families unite, and a second peak is evident in November, presumably when the autumn flocks, having declined through mortality, themselves unite as the weather becomes colder; the lowest numbers, again owing to mortality rather than to the splintering of groups, are predictably present just before the breeding season. These circumstances appear to be the result of ecological adaptations that permit foraging of a certain type, and which are conducive to the formation of well-co-ordinated foraging parties in which, allowing for deaths, membership is stable. It is also the case, however, that babbler flocks, at least arboreal ones, commonly join the mixed-species parties that are formed daily, and, indeed, babblers are frequent components of such parties throughout the family's range within Asia. Even ground-feeding babblers attract followers such as drongos and *Dinopium* woodpeckers.

Arboreal babblers such as the *Alcippe* fulvetas can be nimble and frenetic in their movements, sometimes exasperatingly so to the observer trying to identify or study them, the birds hopping rapidly along and between branches and flying between trees and parts of trees with direct, zipping flight. Some species, however, can be relatively sluggish and methodical, examples being *Cutia*, *Crocias*, *Actinodura* and *Pteruthius*. On and near the ground the movements of the smallest species can be just as quickfire, but babblers at these strata tend to be the bigger species and their actions for the most part slower and seemingly less volatile, albeit no less impressive. Rufous-chinned Laughingthrushes, for example, shift their short wings and long tail to one side or the other as they twist and sideslip through dense vegetation in a smooth movement reminiscent of the rodent-like progress of certain cuckoos (Cuculidae) amid thick branches.

On the ground, some species, such as the Wrenit and the Puff-throated Babbler (*Pellorneum ruficeps*), may either run or hop depending on the context, whereas the *Napothera* wren-babblers always hop and the two *Robsonius* species always walk. Ground-dwelling babblers often move cautiously, and for some, such as the "chatterers" in the genus *Turdoides*, this may be a permanent circumstance, but when foraging confidently their movements can be fleet. The Streaked Laughingthrush (*Strophocincla lineata*) creeps around in a foraging patch but scut-

tles rat-like to the next one, and larger laughingthrushes can move from point to point in great bounding hops, the head held forward, the body horizontal, and the tail swinging slightly from side to side to maintain balance.

The rather strong legs of babblers enable many of them to perform acrobatic movements among branches. This applies even to larger species. Their strong grip is such that a babbler can lean forwards so far on a perch, craning the head well below the body to peer at something of interest, that it seems as if it should have fallen off long before. The Bare-headed Laughingthrush may creep about sluggishly for much of the time, but it can hang upside-down like a giant tit and, in pursuit of falling insects, it can almost free-fall through creepers, using its feet to grasp occasionally at a perch as it does so.

The flight of babblers is generally characterized as weak or, at least, it is strong only over short distances. Small species flit from branch to branch, tree to tree or bush to bush with whirring flight on a direct path, sometimes zooming very intently and purposefully in flocks across clearings, and, in the case of yuhinas, often covering fairly large distances. There are, however, some exceptions to this general flight behaviour. The Wrenit has a weak, relatively slow flight in which the tail pumps slightly to maintain elevation, and it rarely goes farther than 30 m in any one flight, although it is good at avoiding mist-nets. Likewise, the Yellow-eyed Babbler has a feeble, jerky and undulating flight. The Bush Blackcap flies on a direct and undulating course, but sometimes, when moving between perches, it gracefully parachutes down on outstretched wings.

Larger species, as typified by the laughingthrushes, the scimitar-babblers and the *Turdoides* babblers, can be rather clumsy, laboured and jay-like, their short wings and long tail adapted for alternate short bursts of whirring flight and longer horizontal stiff-winged glides, the tail often spread wide, usually ending with an upward swoop to land in leafy cover or else pitching at the base of dense vegetation. Such flights are typically at low level, a few metres off the ground; in open savanna-type country, the trajectory is horizontal or slightly downwards between trees, the birds making up height for the next stage by moving up through the branches. Groups of *Turdoides* babblers usually fly across open areas in single file or loose succession, in a hierarchically led tour of the territory. Of 21 group flights by Yellow-billed Bab-

blers in which individuals could be identified, nine were led by the dominant male, four by the dominant female and six by a high-ranking adult male. It is by such flights, for example, that the birds arrive near water in order to bathe.

Unlike the great majority of passerines, which remain standing in water while they bathe, babblers have a distinctive habit of bathing by repeatedly hopping in and out of the water. While briefly in the water they dip and shake the head, whirring the wings rapidly, with the body feathers widely fluffed out. Then they hop out, continuing to shake the wings, before returning for a second or third dip. This is thought perhaps to be an adaptation to deeper water—captive individuals preferred the deeper of two troughs provided—or an anti-predator device, but, as it is so rare among the passerines, it is difficult to comprehend how these considerations could have evolved to apply just to one group. Perhaps the explanation is to be found in the birds' group-living behaviour or even in some property of the plumage. A pioneer student of babblers in captivity, C. J. O. Harrison, confirmed this behaviour for the Rufous-chinned Laughingthrush, noting how an individual would hop in very briefly but flutter its wings so furiously that it would raise a small fountain of water; but he discovered that a Red-billed Leiothrix would spend even less time in its quick dip, and raise a commensurately higher spray when doing so, such that he "could stand in the house and tell by the fountain of droplets that shot up from the bowl in the aviary away down the garden which species was now enjoying a bathe".

The Wrenit uses standing water, if available, to bathe in this fashion. As with other babblers, vigorous shaking and preening by the waterside follow. When standing water is unavailable, however, it uses the moisture left on shrubs by fog or rain, moving about in the leafy crown, brushing and bumping against the wet leaves until its plumage is damp, and then shaking and preening in the normal way. This behaviour appears not to have been reported for other babblers, but it is almost certain to be a widespread habit and, for some arboreal species, it may be the only means of bathing, and it presumably may take place at any time of day following rain. For timaliids that come to standing water, however, there seems to be a preference for bathing during mid-afternoon lulls or as a pre-roosting activity. As examples, the Black-capped Illadopsis comes to small forest streams in the afternoon, while small parties of Rufous-throated Fulvettas (*Schoeniparus rufogularis*) are often found bathing in secluded streams at dusk.

Although adapted to arid environments, *Turdoides* babblers greatly favour bathing when circumstances allow it, and will come every day to a site in order to do so. In central Kenya, two or more groups of Brown Babblers may share artificial water sources such as birdbaths and drinking troughs; an approaching group choruses in order to announce its arrival, causing the group already present to withdraw. Southern Pied Babblers can be such enthusiastic bathers in artificial or temporary pools after rain that their feathers sometimes become stained from suspended silt, and they sometimes become so waterlogged that they have real difficulty in flying up to a perch, instead running and clambering into the branches. Brown, Yellow-billed and Jungle Babblers all indulge in sun-bathing, and this is probably widespread in the genus. In captivity, Chestnut-collared Yuhinas (*Staphida torqueola*) also sun-bathe, and Wrentits have been seen to dust-bathe, but these types of maintenance and comfort behaviour are very poorly documented among the family.

When preening, almost all species of babbler use the direct method of head-scratching. In other words, and unlike most passerines, they raise the leg directly to the head in order to scratch, rather than lowering the wing and moving the leg over it from behind. K. E. L. Simmons recorded direct scratching by the genera *Pomatorhinus*, *Chamaea*, *Turdoides*, *Babax*, *Garrulax* (*sensu lato*), *Leiothrix*, *Siva* and *Heterophasia* (*sensu lato*), but he found that, inexplicably, the Stripe-throated Yuhina (*Yuhina gularis*) employed the indirect, over-wing method of scratching. The family also has a peculiarity in the way in which it oils its feathers. In contrast to other passerines, babblers seem rarely to oil the head by use of the foot, whereby oil is transferred from the bill to the foot and then to the head. Instead, they usually simply rub the bill with the foot in order to distribute oil along the length of the bill, and then simultaneously rub the bill and head on the extended wing and the wing against the head, all at lightning speed, alternating from wing to wing, and spreading the tail and thrusting it sideways to steady the wing by pressing against it.

Simmons also kept a record of the number of bird species for which anting had been observed. By 1963, the total for the timaliids was 26, including the genera *Pomatorhinus*, *Turdoides*, *Babax*, *Garrulax* (*sensu lato*), *Leiothrix*, *Mesia*, *Siva*, *Yuhina* and *Heterophasia*, the last probably referring, in fact, to *Malacias*. To this list can be added a recently published record of a Bold-striped Tit-babbler (*Macronus bornensis*) which was seen to take ants individually from a twig and wipe them down its wings.

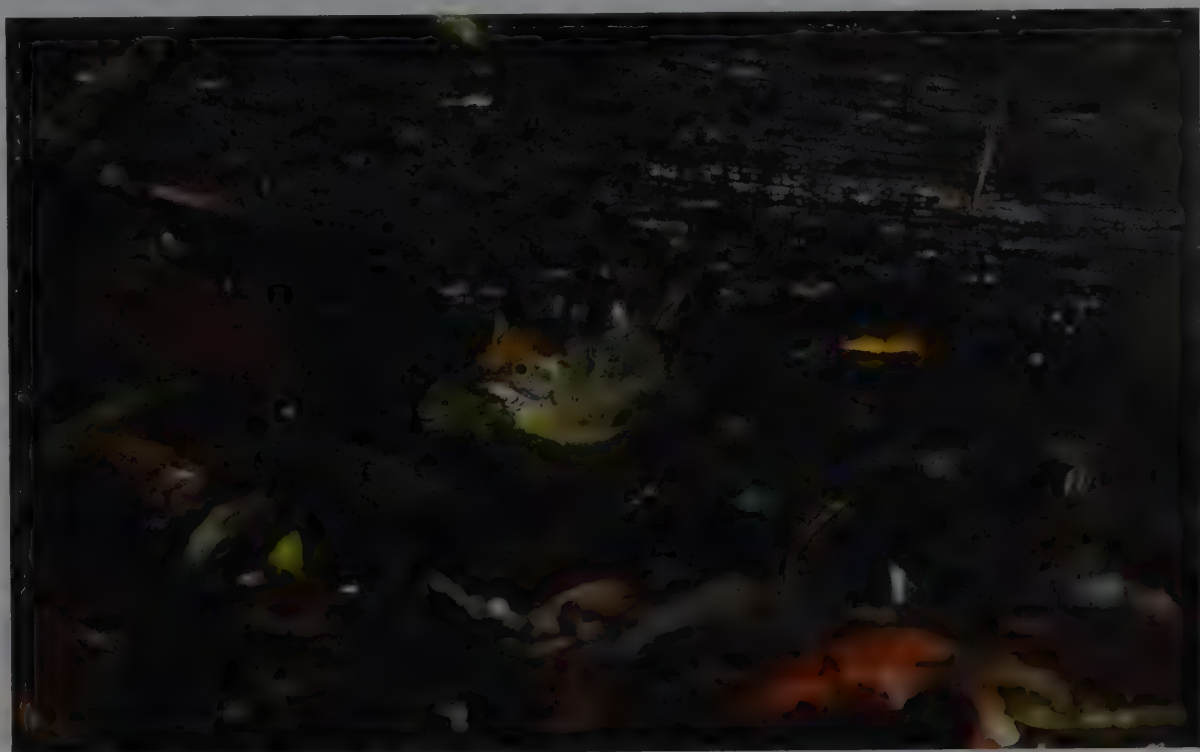
The bathing behaviour of babblers is said to be distinctive and unusual.

Unlike most other passerines, which often stand for prolonged periods part-submerged in water, some babblers dip themselves only briefly to whirr their wings, sending a flurry of spray into the air, before hopping to a dry perch. They repeat this process several times, never spending more than a few seconds in the water.

It is not known what selective pressures have shaped this technique, nor whether it is adopted by the Bar-throated Minla.

[*Chrysominla strigula castanicauda*,  
Doi Inthanon  
National Park,  
Thailand.

Photo: Bernard Van  
Elegem]







Bathing often occurs in tandem with other forms of comfort behaviour. When babblers have drenched themselves with water, they usually retreat to a nearby perch to preen their plumage thoroughly. This activity is interspersed with head scratching, which is almost always direct in timaliids (under the wing, rather than behind and over it). The **Large Scimitar-babbler** is shown here perching on a tree root after bathing, ruffling its wings, and perhaps raising its foot to scratch its head. This species is widespread in evergreen forests from north India to Vietnam and Peninsular Malaysia. It spends much of its time in pairs or small groups foraging on the ground.

[*Pomatorhinus hypoleucos tickelli*,  
Phu Khieo Wildlife  
Sanctuary,  
Thailand.  
Photos: Kanit Khanikul]

Apart from preening and scratching, babblers use at least two other behavioural techniques to maintain their condition: "anting"; and "sunning". The vigorous application of ants to feathers presumably distributes toxic defence chemicals, perhaps to discourage parasites. Direct sunshine has also been shown to reduce the parasite load, but it may have other important benefits in terms of maintaining plumage quality. There is nothing on record in the literature about sunning in babblers, but this photograph of a **Spotted Laughingthrush** suggests that they adopt similar postures to other passerines.

[*Ianthocincla ocellata*.  
Photo: Kenneth W. Fink]



Anting by babblers is of two main types. The large laughingthrushes seem to be specialized for anting on the ground among ant trails. In these cases, the bird seizes an ant and rapidly applies it just once to the extreme tip of one wing, contorting the tail as it does so; the ant is then rejected and another seized for the same purpose, without the laughingthrush shifting its position. The smaller babblers, however, seem to be specialized in anting on a low perch, exploiting ants taken either from the ground or from the foliage. They use each ant several times in a rapid series of applications, again to the underside of one wingtip at a time, with the tail thrust sideways. Reports that the birds are thrusting ants into the tail or the ventral area are the product of an optical illusion. Nevertheless, a Red-billed Leiothrix kept by L. Gibson not only made such movements, rubbing the ants on the outside primary feathers of a drooped wing, but also applied the ants violently to the body under an extended wing, at the same time adopting a stilt-like stance on extended legs, and afterwards in each case eating the insects.

A young female leiothrix kept by Gibson also performed anting movements with a shoot of *Actinidia*, as did a three-year-old female Silver-eared Mesia with a sprig of *Nasturtium*. In each case, the bird stood high, in an anting pose, and vigorously scrubbed itself with the plant for several spells each of 10–15 seconds. In both instances the sprig was sappy, but no clear explanation of this behaviour could be offered any more than for anting. A Rusty Babbler was once seen at dusk to carry a small dead snake near its preening group, then drop it and preen itself ecstatically over the body, attracting four Arrow-marked Babblers to watch from adjacent bushes. Whether the Rusty Babbler was using ants from the snake's body or deriving a more direct stimulus from the reptile's skin is unknown. It certainly seems, however, that anting and anting-like behaviour are relatively frequent and widespread among the babblers, and deserve more investigation.

Even so, ■ far more prevalent and important timaliid comfort behaviour is that of allopreening. Harrison suspected it to be practised by most, if not all, species, and he had records for *Garrulax* (*sensu lato*), which on current knowledge would have included also the species in *Dryonastes*, *Strophocincla*, *Stactocichla* and *Ianthocincla*, as well as for *Leiothrix*, *Mesia*, *Pomatorhinus*, *Chrysomma*, *Turdoides* and *Chamaea*. To these can now be added

*Zosterornis* and *Crocias*, and a careful gleaning of the avicultural literature would probably reveal many more. Harrison noted that all of the birds on his list have apparently long or permanent pair-bonds, and that the behaviour seems deeply ingrained. Even solitary captive individuals of the White-crested Laughingthrush and Yellow-eyed Babbler have been seen to pause during autopreening and then to adopt allopreening-solicitation postures, such as wing-drooping, head-raising and erecting of the feathers on the head and neck.

Allopreening by babblers cannot be dissociated from another notable behaviour, otherwise demonstrated most markedly by waxbills (*Estrildidae*), known as "clumping". Clumping describes the huddling behaviour exhibited by social babblers, particularly *Turdoides*, during periods of rest in the course of the day and at night-time roosts. It is sometimes initiated simply when one individual approaches another on a perch, landing some centimetres away, and then sidling up to it and pressing against it. Those joining a pre-existing clump, however, are less inhibited and alight directly next to the already clumped birds, and, indeed, the vigour with which babblers attempt to join a clump appears to be positively correlated with the number of individuals already in it. This clumping, even when only two birds are involved, is always accompanied by allopreening. Once clumped, first one individual and then the other preens its companion's head and neck. Special attention is given to the chin and throat, the receiving bird remaining stock-still, frequently with the bill held upright. Often, one babbler will preen the other hurriedly for a few seconds as if in encouragement, and then hold its own head up in position, inviting reciprocation.

In A. J. Gaston's classic study, allopreening by Jungle Babblers proved to be commoner in winter than in summer, possibly because of heightened aggression and competitiveness in the latter period, and also to be commoner in the afternoon lull when feeding was least intensive. Allopreening was otherwise common immediately following an event that induced an elevated state of excitement, such as a confrontation between groups, the giving of a predator alarm or disturbance by a human observer. Gaston suggested that allopreening invitations by ■ low-ranking member of the group are attempts to form coalitions with senior-ranking members in order for the former to promote its own status, by demonstrating to other group-members the degree of its





Many babblers are vocal birds, as indeed their name suggests. The extent of their repertoires is highly variable, as is the acoustic structure of their signals, but year-round singing is the norm. The song of the **Yellow-eyed Babbler** consists of loud whistled phrases, often given at fairly short intervals. The alarm calls are dry, harsh and churring. Individuals disturbed while foraging or nesting will often scold a predator with these calls from close quarters. This species is very widespread in an Asian range delimited by Pakistan, China, Sri Lanka and Vietnam. It avoids forest, preferring reedbeds, coarse grassland, swamps, and the margins of agriculture.

[*Chrysomma sinense sinense*,  
Bangphra  
Non-hunting Area,  
Chonburi, Thailand.  
Photo: Kanit Khanikul]

acceptance by that senior member. This explains why most soliciting is directed at the most dominant individual and why clumping exerts a stimulus for others to clump.

A. Zahavi and A. Zahavi's even more classic study, forming the core of their major book *The Handicap Principle*, concludes that allopreening, in this case by Arabian Babblers, is a repeated test of the birds' social bonds with each other:

"The babbler being preened puts itself at the preener's beak, feathers fluffed and eyes often closed to let the other preen its facial feathers fully. The recipient of the preening can hardly see in that state and obviously is not prepared to fly or flee. The preener tests the other's will to cooperate with it, and the one being preened shows off that it trusts the other to warn it in case of danger. Both, by clumping and allopreening, take on a greater risk than birds resting alone."

Confrontations between neighbouring groups can be seriously risky events for an individual bird, and it is vitally important that it constantly reassures itself that, if full-scale fighting does take place, its groupmates will be no less committed. Power relationships within groups are always slightly, and occasionally dramatically, shifting as young birds mature, older ones die off, some individuals immigrate or are evicted, and each member constantly jostles for supremacy of some sort. Therefore, a group-member can constantly check and confirm the solidity of its status within the group and also the reliability of the other members' commitment to it by means of the many bouts of daily clumping and allopreening, which every few days are supplemented, at least among Arabian Babblers, by a remarkable group dance, performed at dawn in the open, in which the birds press against each other, squeezing under, over and between partners in a curious frenzy of activity. Perhaps unsurprisingly, the soliciting of allopreening is particularly frequent among juveniles and first-year individuals.

A less frequent but still common aspect of the behaviour of Arabian Babblers is allofeeding, but this varies with food availability and season. Experimental manipulation through food supplementation of a group and of individuals within the group, which has the effect of greatly increasing allofeeding rates, has elegantly shown that allofeeding is a dominance display. It is almost al-

ways the case that an individual of higher rank feeds one of lower rank, and never the reverse. The exceptions are situations when babblers of equally low rank engage in reciprocal allofeeding, and it is notable that receivers often refuse proffered food, thereby declining to signal their subordinate status to the giver. Even so, because dominance rankings are reasonably stable, allofeeding can be interpreted as displaying the prestige of the donors and the degree of dominance of one individual over another.

Social status also influences vigilance behaviour, for all the same reasons. Foraging groups are likely to be attractive to predators, especially if the foraging is being done in a herbaceous layer



The genus *Stachyris*, as currently constituted, seems to embrace three different vocal groups, each of which gives different song-types. The **Chestnut-winged Babbler** belongs to a group of three species with songs made up of mellow whooping or pooping notes, given in series. To produce these low-pitched notes it inflates its neck, baring two patches of skin. A similar effect is seen in passerines with comparable songs, such as the Neotropical *Hylopezus antipittas*. In the **Chestnut-winged Babbler**, the puffed-out neck-skin is a conspicuous pale blue or violet.

[*Stachyris erythroptera erythroptera*,  
Johor, Malaysia.  
Photo: Morten Strange]

Babblers are oscine passerines and are therefore thought to develop songs via an imprinting-like process.

Despite this fact, their songs generally lack some features found in many oscine families, including wide repertoires and mimicry. Vocal signals are a useful guide to higher-level taxonomic relationships in the Timaliidae, with the members of clear-cut genera tending to share distinctive song-types.

The **Rusty-breasted Wren-babbler**, for example, gives a series of loud, clear, mid-range whistles, typical of the genus *Turdinus*.

[*Turdinus rufipectus*,  
Gunung Kerinci, Sumatra.  
Photo: Robert Hutchinson/  
Birdtour Asia]



which may hinder the vision of the forager. Gaston found that, for at least 82% of the time when Jungle Babblers were observed, a sentinel was posted, for periods of less than four minutes in the morning but up to ten minutes in the afternoon. Change-overs were effected in three ways. In one, the sentinel flew down to feed and another bird then flew up to replace it. In the second, which was sometimes triggered by a call from the sentinel, a relieving bird flew up to join the sentinel and the latter then descended. In the third, the same thing happened as with the second method, except that the sentinel remained perched but diminished its vigilance and began autopsyching, before eventually descending to feed. Most sentinels were male in gender.

The Zahavi team has shown that no reciprocal altruism, no "fair sharing" of sentinel duties, is involved in this process and that, in reality, quite the opposite is happening. Despite the fact that the act of standing guard alone on a relatively exposed perch is itself a risky thing, and one that involves forgoing food for considerable periods as individual babblers may spend 2–3 hours per day on this task, the birds are actually competing among themselves for the chance to be sentinel. Careful study to record which birds stand guard and which replace them reveals that each individual makes the most effort to replace the one just below it in rank, so that, when it does so, it reconfirms its status in the group hierarchy. Some fascinating patterns in the group dynamics result. Frequent attempts to guard made by the second-ranking (*beta*) male are thwarted by the dominant (*alpha*) male, which keeps replacing him, but, because the *alpha* male cares far less about the threat posed to him by the third-ranking (*gamma*) male, the latter is able to do more guarding than is the *beta* male. When the *alpha* male dies, however, the *beta* male immediately takes over his role as the chief vigilante in the group, and turns the tables on the former *gamma* male, which is now the new *beta* male.

Once a threat has been spotted, the sentinel gives an appropriate warning. Recent study of sentinel behaviour among Arabian Babblers living in the path of a raptor migration flyway shows that the birds are sophisticated in their ability to discriminate between species posing a high predation risk and those representing lower threats, as well as in judging the degree of threat from the high-risk species, but generally always erring on the side of caution when uncertain of themselves. Moreover, they have slightly different-sounding calls for different predators, such

as raptors, snakes or cats, and this will doubtless be true of all the *Turdoides* babblers. The birds certainly learn quickly, as biologists who catch and ring them discover to their cost: the babblers immediately cease all habituated behaviour, they avoid the place of capture, and they growl in disapproval whenever the biologist appears. They rarely tolerate birds of prey such as kites and hawks (Accipitridae) and owls and owlets (Strigidae), or ground predators such as mongooses (Herpestidae) and snakes, near or in their territory or foraging area, and they mob them persistently. Furthermore, because of their numbers and their confidence in one another, they will sometimes launch fierce attacks on dangerous intruders. In one notable case, a group of five Southern Pied Babblers retaliated against a juvenile Gabar Goshawk (*Micronisus gabar*) that had caught one of its number, a nearly full-grown juvenile, attacking the hawk physically for ten minutes until it released the babbler and flew off; after only 15 m, however, the babblers caught up with the raptor, pinned it down and attacked it for a further five minutes, scrambling over it, constantly pecking at its head and neck, and leaving it to die of what proved to be a fractured neck joint, spinal-cord damage, puncture wounds and haemorrhages.

Food competitors, too, can feel the width of *Turdoides* displeasure. Southern Pied Babblers chase Cape Glossy Starlings (*Lamprolornis nitens*) from foraging areas, food supplies and daytime roosts, and displace doves (Columbidae), sparrows (Passeridae), weavers (Ploceidae) and shrikes. They even get into disputes with Arrow-marked Babblers in some areas. In one case, two groups, one of each species, approached each other, while emitting a cacophony of raucous calls, and seemed to form a loose circle. Each group then "delegated" one of its members, presumably a dominant individual, to take on the other species. Physical fighting, including much rolling on the ground and grabbing with the feet, ensued in the middle of the circle of onlookers, which raucously called as if in support of their champion. Southern Pied Babblers have been seen to defend daytime roosts and water resources from Arrow-marked Babblers, although the two species may forage in close proximity at other times.

Other babblers are rather more restrained, which is perhaps why there appear to be few examples of aggressive behaviour by them. The Brown Illadopsis, secretive, suspicious but inquisitive, will join other birds in mobbing snakes. Fulvetas in the genus *Alcippe*, despite their nervous-seeming disposition, flock





around an intruder demonstratively. There is probably a relationship between strength of reaction and the presence of an active nest or young, but food is clearly also a trigger, as illustrated by the Rufous Sibia (*Malacias capistratus*) and White-browed Shrike-babbler (*Pteruthius flaviscapis*), both of which can be very aggressive towards other species feeding in the same area as they. The Wrenit vigorously scolds nest predators such as the Western Scrub-jay (*Aphelocoma californica*), the bobcat (*Lynx rufus*), the grey fox (*Urocyon cinereoargenteus*), alligator lizards (*Elgaria*) and snakes, and potential brood parasites such as the Brown-headed Cowbird (*Molothrus ater*).

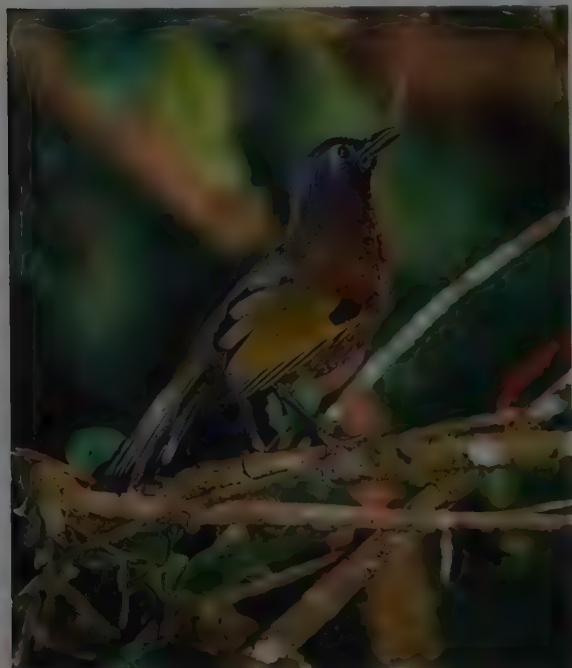
There are very few records of babblers being taken as prey, the best-known examples involving a laughingthrush caught in flight by a Black Kite (*Milvus migrans*) and an Arrow-marked Babbler found as prey of a Wahlberg's Eagle (*Aquila wahlbergi*). Nevertheless, the threat is ever present, and when a predator makes

an attack, rather than merely putting in an appearance, these and other smaller birds do, of course, take sharply to cover and are silent. As is discussed later (see Food and Feeding), drongo alarm calls, as well as strong alarms from sentinels in *Turdoides* groups, cause ground-feeding timaliids to fly up into cover. Caught unawares, they also simply freeze. Rufous-chinned Laughingthrushes do this when disturbed, and in so doing manage to "disappear" entirely; Harrison found himself repeatedly having to search the ground of his aviary if he entered it too quickly, for the birds' immobility and camouflage made it impossible to see them without real effort. The simple habit of skulking is, of course, its own kind of anti-predator behaviour. In Bhutan, the Rufous-necked Laughingthrush is a fairly common species, but it becomes so secretive in the later part of the breeding season that there are no July and August records of it in this country, and only a handful between the end of May and the start of November.

Night brings its own risks, and the roosting behaviour of babblers is a rich seam of unexplored questions for behavioural ecologists. Unfortunately, the evidence is very limited, for the most part restricted to a few anecdotes from the old literature, a few accounts of popular cagebird species, or the inevitable studies of *Turdoides* babblers. In all cases clumping occurs, even when only two birds are involved. Uniquely in the family, groups of Dark-fronted Babblers use an old nest for roosting. Yellow-eyed Babblers roost in groups of 20–30 individuals, but split up into smaller groups by day. White-throated Laughingthrushes do the opposite, foraging by day in flocks of up to 40 but roosting at night in subgroups of 2–6 individuals, each in a different tree. White-crested Laughingthrushes huddle so close together that they may cover each other with their wings. Captive Wrenitis sleep in groups of 2–5, their feathers fluffed and intricately overleafed, the individuals sometimes leaning against each other and using only the outer leg for support. Interestingly, pairs of Chestnut-collared Yuhinas roost on a twig, the two side by side but facing in opposite directions, each with the body inclined steeply forwards at 45°, as if poised to hop down from the perch. Two roosting Red-billed Leiothrixes can press themselves so tightly together on the roosting branch that they present the appearance of being a single bird with two heads and two tails, the ruffled body feathers forming a single fluffy ball which looks all the stranger when the birds tuck their heads down. So strong is this tendency that, in captivity, individuals of the same sex will readily roost in this manner and, if no other conspecific is present, lone individuals will attempt to clump with other babblers or even

The songs of *Turdoides* babblers are rarely noted for their beauty. These social birds do not produce melodious refrains, whistled notes or duets, but instead give raucous chattering cries. The harsh grating notes of the **Bare-cheeked Babbler**, for example, are often given communally in a deafening cacophony. These group vocalizations serve as a territorial or group-advertising signal, and as a rallying cry during territorial interactions.

[*Turdoides gymnogenys* kaokensis, Halali camp, Etosha National Park, Namibia. Photo: Geoff McIlhennion]



While some babblers vocalize as a group, others sing alone or as a pair. The male **Malayan Laughingthrush** usually sings with a clear and far-carrying "wip-weeeoo", the second syllable stressed; the female may accompany this with low mewing notes. The songs of babblers may provide an insight into the taxonomic status of geographically isolated forms, and in this case they reveal that the Malayan Laughingthrush is allied to, but probably not conspecific with, the Chestnut-crowned Laughingthrush (*T. erythrocephalus*), with which it was previously lumped.

[*Trochalopteron peninsulae*, Fraser's Hill, Malaysia. Photo: Jimmy Chew]

with unrelated passerines and non-passerines. Gibson noted that attempts by a single leiothrix to huddle with any sociable species were especially strong in cold weather, which seems to imply an underlying thermoregulatory value and poses some interesting biological questions about the physiology of this and other timaliids. Where clumping involves more than two individuals, however, a central position may have a further value, that of aiding predator avoidance.

In the case of *Turdoides* babblers, the roost-site is often quite low, 2–6 m from the ground inside the canopy of a tree or bush, although the Southern White-rumped Babbler may use reedbeds. One group of Jungle Babblers roosted in the same tree on eight successive days, while another varied between two trees, and it may well be that particular roost-sites are used over much longer periods of time, although not necessarily every night. In Gaston's study, roosts were usually at least 3 m up, on a branch 2–5 cm in diameter, with the innermost bird close to the junction with a larger branch. Usually, all birds faced in the same direction. Sometimes the babblers went straight to the roost-site, but on other occasions they visited "false roosts", up to 15 in number, before settling. Those entering roosts often clambered over the backs of earlier arrivals and tried to force themselves between already clumped birds. These struggles for position sometimes continued into darkness, but at other times everything passed off without any disorder. In cases where individual identities could be determined, dominant birds tended to enter the roost first, and non-breeding adults and second-years tended to be last. On some occasions, adults arriving at the roost late sat and waited for several minutes before joining the end of the roost line. The pattern, which seemed to be constant, was that the central birds were the breeding pair and one of the outer ones was a non-breeding adult male; in some cases, young juveniles entered the roost last but squeezed themselves into the centre of the group. Thus, over a period of several months, young juveniles perch first in the centre, then at 2–3 months of age move to the outer third, although not the extreme edge, and then move either to the outside or to the inner third as the next generation of juveniles arrives. Unsettled roosting behaviour may be related to issues of position within the roost line as age forces changes on it.

In India, it was once observed that members of a group of Common Babblers usually roosted such that some faced in one direction and others in the other, but that, when all faced the same way, towards the wind, this accurately predicted coming storms at night. "The babbler as barometer" was the headline. It seems, however, that in all other cases, whatever the species, roosting individuals all face in the same direction. One would conclude



that this intriguing anecdote perhaps suffered from a rather small sample size, possibly no more than a couple of cases.

## Voice

With such English names as "babbler" and "laughingthrush", it is hardly possible to think that vocalizations are unimportant for the Timaliidae. Of course, only a small proportion of babblers babble and few laughingthrushes laugh, but there is a wide variety of songs and calls in the family, as one would certainly expect from species which typically live well out of sight in thick cover or move about in large groups. A few species have immensely rich songs, some, indeed, being among the best-kept secrets of the avian world, whereas a few have no identifiable songs at all. Some songs are complex, and others simple. Some species duet, some sing as "trios", and others chorus, but most timaliids have pleasant whistlings and trillings, given by the male of a pair.

Duetting by babblers doubtless has a major function in pair-bond maintenance, but the phenomenon has not been analysed, and it is not clear how widespread it is. Even so, the evidence points to its extending across many taxa. For example, in this survey alone, duetting and antiphonal calling have been unambiguously recorded for 22 genera, representing roughly one-third of all babbler species: these genera are *Pomatorhinus*, *Sphenocichla*, *Macronus*, *Ptyrticus*, *Illadopsis*, *Pellorneum*, *Malacopteron*, *Malacocincla*, *Trichastoma*, *Turdinus*, *Napothera*, *Ptilocichla*, *Turdoides*, *Melanocichla*, *Sirophocincla*, *Ianthocincla*, *Trochalopteron*, *Liochla*, *Actinodura*, *Malia*, *Rhopophilus* and *Parophasma*. This list, however, does not take into account the information that comes from aviculturists, who have reported, for example, that in both *Mesia* and *Leiothrix* the sexes can be distinguished by call, the female having a short loud two-syllable whistle, to which its mate will respond with a quiet version of his song, or that the female Chinese Hwamei calls with a series of monotones, to which the male answers with a short burst of song. Evidently, these more informal aviary communications mirror circumstances unreported in the wild, and tend strongly to suggest that antiphonal calling between paired individuals may be a feature throughout the family, in some species and genera blooming into full song duets. It seems likely that all of this relates to the importance of the pair-bond among babblers, which is associated with the phenomenon of living in large groups.



Duetting, a common feature in babblers, has been unambiguously reported from 22 timaliid genera. This figure will doubtless increase when new information from field ornithologists and aviculturalists is compiled. To begin with, the monotypic genus *Kenopia* may belong on the list, judging by the evidence of this photograph. It appears to show a pair of **Striped Wren-babblers** vocalizing side by side in the manner of many duetting timaliids. Whether this species gives a true duet remains to be described.

[*Kenopia striata*,  
Johor, Malaysia.

Photo: Morten Strange]

Duets can be explained in terms of mate defence or joint territory defence, and it is sometimes difficult to disentangle these factors. Chorusing is more easily understood.

Three or more birds clump shoulder-to-shoulder vocalizing communally, as demonstrated by these **Red-tailed Laughingthrushes**. Such choruses show varying degrees of co-ordination: some are random, some highly syncopated, but all are thought to serve in group defence of a territorial resource.

[*Trochalopteron milnei*.  
Photo: Brian J. Coates]





Most babblers are essentially insectivores that supplement their diet with varying amounts of vegetable matter. Some are highly specialized; many are ecological generalists and opportunists. Their stout bills are designed for digging, prising and probing in a variety of substrates. The **White-browed Scimitar-babbler**, for example, forages anywhere between the ground and the lower canopy, using its decurved bill to pick items from leaf litter or tangled vegetation. In this case it has captured a large insect. This is a widespread, polytypic scimitar-babbler, occurring from India to Indochina.

[*Pomatorhinus schisticeps olivaceus*,  
Kaeng Krachan  
National Park,  
Thailand.  
Photo: Kanit Khanikul]

Being mainly tropical, sedentary and either pair-territorial or group-territorial, babblers seem to sing all through the year. In Africa, the Brown Illadopsis, which J. P. Chapin noted as being the first bird species to call at dawn in the country then known as the "Belgian Congo", now DR Congo, sings all year, even at the height of the long dry season, in Gabon. Similarly, the chorus song of Sharpe's Babbler is heard all year, but with more complex chorusing over certain spans of months, presumably in relation to breeding activity. The Spiny Babbler of Nepal also sings in all months, but with greater frequency during the long period from March to September. The Wrenit does likewise, but with two peaks, the first from April to July, when breeding, and the second from late August into September, when expelling the young from the territory, and with the weakest output in November–December. With this species, as with birds of many different families, unmated males usually sing more frequently than do mated ones. One such was heard to deliver 450 songs in 90 minutes, a rate of five songs per minute, whereas in the more relaxed world of the mated male these songs, which are delivered in "bouts" of 3–6 at a time, are usually given at a rate of just 4–5 bouts per hour, an order of magnitude fewer.

The song of the Wrenit consists of five or six dry notes, all the same, that accelerate into a trill. This is not, in fact, unexpected from a bird which is judged to be relatively close to the *Sylvia* warblers (see Systematics), bearing in mind that several *Sylvia* species of xerophytic scrub have dry buzzing, rattling songs that somehow seem to match the dryness of their habitat. In stark contrast, the song of the African Hill-babbler (*Pseudoalcippe abyssinica*) is so strikingly beautiful that it has been considered by several ornithologists to be one of the finest in Africa. This species was described by H. Granvik as "the finest master-singer I have heard among African birds", and this, again, is not unexpected, given that *Pseudoalcippe* is also close to *Sylvia*, the parallel in this case being to the Blackcap (*Sylvia atricapilla*), a songster of celebrated richness in the lush, leafier clearings and glades in the woodlands that it inhabits. This latter is, indeed, the type of habitat used by both species of *Pseudoalcippe*.

The songs of the two *Pseudoalcippe* species are virtually identical, and it occasionally transpires that taxa that are strongly distinguishable in their morphology are poorly distinguishable in their vocalizations. For example, the Golden-crowned Babbler has a song very like that of its congener the Black-crowned Bab-

bler, while the Panay Striped Babbler sings like the Luzon Striped Babbler (*Zosterornis striatus*), and the Rufous-fronted Babbler sings like the Rufous-capped Babbler (*Stachyridopsis ruficeps*) and, indeed, like the Golden and Black-chinned Babblers (*Stachyridopsis pyrrhops*). Among the laughingthrushes, the Rufous-cheeked, Grey, Black-hooded, Cambodian and White-necked all sound the same, as do the Black and Bare-headed Laughingthrushes, and the Brown-cheeked has a song just like that of Elliot's Laughingthrush. Even among the "non-babblers" (see Systematics), the Chestnut-fronted (*Pteruthius aenobarbus*) and the Black-eared Shrike-babblers (*Pteruthius melanotis*) sound very similar.

Playback experiments designed to determine whether two taxa may be better considered species or subspecies do therefore, in the case of the Timaliidae, sometimes encounter problems. On the other hand, there are some species in which the song varies geographically, the Brown Illadopsis and the Spot-necked Babbler (*Stachyris striolata*) being two such examples, although the extent to which this carries any taxonomic information has not yet been explored. Moreover, the types of vocalization of certain genera and groups of babbler appear to be helpfully indicative of relatedness at levels above species rank. *Lioparus* and *Fulvetta* possess songs consisting of a few short high-pitched notes, and are clearly very closely related. The songs of *Yuhina* are not particularly well known, but some, at least, are sibilant and ringing, and consist of several to many notes. In contrast, the songs of *Staphida*, which until recently was regarded as a junior synonym of *Yuhina*, are the simplest imaginable, one or two notes in a series.

Across the South China Sea, the Philippine Islands host some intriguing species and no fewer than six endemic genera. The Flame-templed Babbler, for long included in the rather large South-east Asian genus *Stachyris*, has a song that helps to set it a long way apart; it sings a very pretty, descending, slurred jingle, reminiscent of, if anything, a speeded-up Silver-eared Mesia, and is now accorded a genus of its own, *Dasyerodapha*. The *Sterrhoptilus* babblers for which relevant information is available have simple, weak songs consisting of rapidly repeated single notes. *Zosterornis* babblers, in contrast, have high-pitched, rapid, jumbled songs that resemble those of white-eyes (*Zosterops*), inevitably triggering the fanciful notion that the accidental similarity of their scientific names may happen to indi-

cate a similarity in ancestry. As with *Dasycrotapha*, both of these timaliid genera were until recently merged with *Stachyris*, but both are clearly vocally distinct from it. Meanwhile, the song of the minuscule *Micromacronus* appears to be unknown, but those of the two remaining Philippine genera, *Leonardina* and *Robsonius*, are strikingly similar to each other, such that a relationship between the two appears very likely, despite the former often being considered a *Trichastoma* and the latter a *Napothera*. Both have an extremely high, insect-like whistling, quite unlike any sound yet recorded from any other species of babbler.

*Alcippe* babblers differ from those now treated in *Fulvetta* in the slightly more complex structure and flutier tones of their songs, but *Schoeniparus*, which also used to be subsumed in *Alcippe*, is vocally very similar to the latter. The song of *Rhopocichla*, the south Asian Dark-fronted Babbler, which has likewise been treated in *Alcippe*, has not been reported, and it is conceivable that this species does not have a true song. In contrast, the south Asian endemic Tawny-bellied Babbler, the sole member of the genus *Dumetia*, has a pleasant but piercing whistling song of descending notes. This connects with certain *Stachyris* babblers, but not others, although no record exists for the song of three of the twelve species. *Stachyris* songs are of three types, one involving pleasant simple high-pitched whistled phrases, as sung by the White-necked, Spot-necked and Grey-headed Babblers, another involving rolling quavering trills, as given by the Grey-throated, White-breasted and Crescent-chested Babblers (*Stachyris melanothorax*), and the third involving repeated mellow whooping and pooping sounds, as sung by the Black-throated, Chestnut-winged and Chestnut-rumped Babblers. The last four species named appear to have some kind of accompaniment from a presumed female mate, and the Chestnut-rumped Babbler has been reported as giving its whooping call in apparent trios or more.

There is a link in these latter calls, both in their "whooping" quality and in the emergence of a second singer, to the songs of the scimitar-babblers. The Sickie-billed Scimitar-babbler has a staccato hollow piping "wuwuwuwu...", and several of the *Pomatorhinus* species make similar sounds in duet, examples being the White-browed (*Pomatorhinus schisticeps*), Indian, Sri Lankan (*Pomatorhinus melanurus*), Chestnut-backed and Orange-billed Scimitar-babblers. The sounds produced by the second bird, presumed female, are often highly synchronized, so that the resultant impression is of a coherent "single" song. There are, however, degrees of co-ordination and structure in these songs that

may vary with season, as well as perhaps between species, and in some cases the duet is more obviously antiphonal, producing a "statement and answer" sound, rather than something so finely honed that a listener has difficulty in determining that two birds are involved. Indeed, the overall vocabulary of scimitar-babblers seems to be rather varied and not all songs involve duets, many being clearly the output of a single individual, but some being the combined efforts of three or more voices. This situation presumably mirrors their social lives, spent in pairs in the breeding season and in groups outside it.

Similar considerations may in due course apply to the genus *Sphenocichla*, for long thought to consist of one species but, following recent vocal evidence from P. I. Holt, alongside significant morphological differences, now treated as two species. These "wedge-billed" babblers possess surprisingly clear, well-structured songs but, again, duetting of some sort is frequently involved, although the birds live in fairly large groups outside the breeding season. The smaller *Spelaornis* wren-babblers are all rather similar in their song type, which involves loud, quickly repeated, rather mechanical series of jingling rolls and trills, but the Spotted Wren-babbler, which is normally treated as a member of *Spelaornis* (but see Systematics), has a very different, very high-pitched song which strongly suggests a link to *Pnoepyga* wren-babblers. These latter sing with high-pitched, simple series of notes, becoming more slurred and rambling in the song of the Scaly-breasted Wren-babbler (*Pnoepyga albiventer*).

The four *Stachyridopsis* babblers, the songs of which are, as mentioned above, almost inseparable to the human ear, give long rapid series of high-pitched monotone piping notes and are by this character well confirmed in their generic distinctiveness. This monotone piping may or may not provide a link to the *Macronus* babblers, the songs of which, like those of the scimitar-babblers and some *Stachyris*, commonly consist of rather low-pitched, hollow hooting notes, and which, as with *Pomatorhinus* and some others, may involve several birds, at least in the case of the Stripe-headed Tit-babbler. There appears, however, to be no call-and-response duetting in *Macronus*, whether highly co-ordinated or not; rather, the main singer produces a string of hooting notes, and this may or may not be accompanied by a second singer with a rather different, seemingly huskier and less organized series of calls. The distinctive Chestnut-capped Babbler has a husky metallic whinnying, sometimes involving more than one individual.

The **Silver-eared Mesia** is generally encountered foraging low-down at forest edges and in shrubby clearings, but it will ascend to the subcanopy of montane forests. It hunts for insects in foliage, occasionally making flycatching sallies after flushed prey, but never pursuing very far. It supplements this diet with small quantities of berries, fruits and seeds. Like many babblers, it often associates with mixed-species foraging flocks, even during the breeding season. Being so colourful, and having such a rich, melodious song, the Silver-eared Mesia is a popular cagebird in South-east Asia.

[*Mesia argenteauris tahanensis*, Fraser's Hill, Malaysia. Photo: Jimmy Chew]







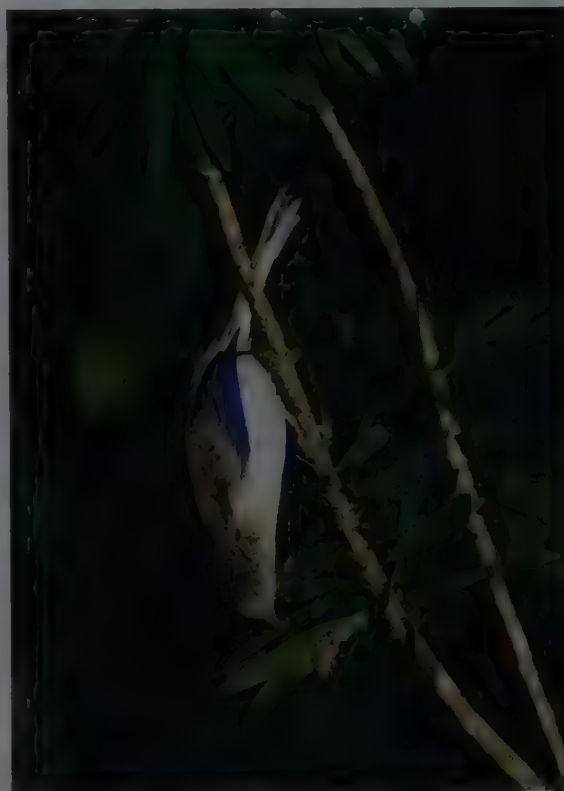
**The Grey-headed Babbler** is one of several timalids that often forage among tangled vegetation and dead leaves. This species is usually encountered close to the ground, but sometimes ascends a few metres above ground where there are tangled creepers or hanging clusters of dead leaves. It usually targets small to medium-sized insects such as Orthoptera, and larval Coleoptera and Lepidoptera. The Grey-headed Babbler is a Sundaic species ranging in the lowlands to around 1000 m.

[*Stachyris poliocephala*, Khao Pra-Bang Khrum Wildlife Sanctuary, Krabi, Thailand. Photo: Kanit Khanikul]

The African genera *Ptyrticus* and *Illadopsis* both have songs in which two birds may participate. In the case of the first, the Thrush-babbler, this appears to happen only in one type of song, a series of disconnected notes like those of an Old World oriole (Oriolidae) that the presumed female instantly echoes. In *Illadopsis*, the extra participation is recorded for three of the seven species, the Pale-breasted (*Illadopsis rufipennis*), Brown and Mountain *Illadopsises* (*Illadopsis pyrrhoptera*), which happen also to be the ones in which the male is not reported as moving into higher strata of vegetation in order to sing. With these species, the additional sounds may be provided by one or two individuals, and consist of rather unco-ordinated conversational back-up chattering sounds. The main sound, from the presumed male, is a simple set of resonant melodious whistles, structurally and tonally quite distinct from the songs of Asian *Trichastoma* and *Malacocincla* babblers, in which genera the African taxa have in the past been treated.

Duetting is performed by the great array of mainly South-east Asian and Sundaic rainforest babblers associated with *Trichastoma* and *Malacocincla*, namely the genera *Pellorneum*, *Malacopteron*, *Turdinus* and *Napothera*, with *Ptilocichla* as a partial outlier. Songs of forest-dwelling *Pellorneum* are simple repeated two-note or three-note whistles, but these babblers also have slightly more complex, cheerful, skipping songs, sometimes dubbed "whistling schoolboy" or "errand-boy" tunes, which can trigger duet responses; the former song type appears to have a territorial function, while the latter may reinforce the pair-bond. *Malacopteron*, which does a fair amount of group calling, also has songs of two, and sometimes more, types. With the Sooty-capped Babbler it is the main song type, a slow string of up to nine rising-and-falling whistles, that often prompts back-up calling from the presumed female, while the secondary song type, as with *Pellorneum*, is the jauntier "errand-boy" version; whether this means that the functions of the songs are reversed is not known. The song of *Ophrydornis*, for long treated in *Malacopteron*, is not particularly different from songs of that genus but is more subdued and protracted, and duetting has not been documented. Similarly, of four *Malacocincla* and three *Trichastoma* for which the voice is known, no evidence of duetting has been found for two of the former, namely Horsfield's Babbler (*Malacocincla sepiaria*) and the Ashy-crowned Babbler (*Malacocincla cinereiceps*), and for one of the latter, the Ferru-

ginous Babbler (*Trichastoma bicolor*), but this may simply be an observational artefact. At present, the Short-tailed Babbler (*Malacocincla malaccensis*) is known to perform a highly co-ordinated duetting song, whereas "duets" of Abbott's Babbler (*Malacocincla abbotti*) involve the female contributing a few sharp notes in an unsynchronized manner, and only Abbott's is known to perform evening group calling. This may all change with greater study. The songs of these two genera are variable in quality but mainly rich, loud and flutey; those of the White-chested



**The Blue-winged Siva** is a group-living species, often found in parties of 5-20 individuals and at least sometimes breeding co-operatively. Groups of sivas spend much time foraging with mixed-species flocks of passerines in the canopy of montane forests, usually alongside other flock-following babblers such as minlas, cutias and sibilas. A variety of foraging techniques are employed by sivas in the hunt for insects and fruit. This individual is hanging acrobatically, apparently with the intention of snatching a poisonous-looking bug from the foliage.

[*Siva cyanouroptera sordidior*, Fraser's Hill, Malaysia. Photo: Morten Strange]

**The Short-tailed Babbler**

is not a flock follower. Singles or pairs forage low down or on the ground in the understorey of Sundaic forests. Here, they hunt for a variety of insects, including beetles, grasshoppers and ants. This individual is using its hook-tipped bill to extract a larval insect from a rolled leaf. In doing so it is demonstrating a distinctive feature of timaliid foraging behaviour: the use of the foot to grasp and clamp food items. This habit is generally uncommon in passerines, but shared with allied families such as the crows (*Corvidae*), the shrikes (*Laniidae*), the tits (*Paridae*) and the drongos (*Dicruridae*).

[*Malaccocincla malaccensis polioegenys*, Borneo.  
Photo: Roland Seitre]



Babbler are variable, with at least seven different permutations noted among all individuals heard at one site in Sumatra.

The Striped Wren-babbler, in the monospecific Sundaic genus *Kenopia*, produces a little inflected piping note, clear and monotone, and its presumed closest relative, the sympatric Bornean Ground-babbler, in *Ptilocichla*, makes a similar kind of song but, because it sings in sequential duet, it sounds as a double note, "doo-dee". The other two *Ptilocichla*, in the Philippines, are somewhat divergent, but the Streaked Ground-babbler (*Ptilo-*

*cichla mindanensis*) recalls *Trichastoma* with its two song types, while the Palawan Ground-babbler hints at its proximity to *Napothera* with mournful whistles. *Napothera* commonly embraces *Turdinus* and *Gypsophila*, but these are here separated for other reasons (see Systematics). *Gypsophila* is very different in its song, having a quick jumbled chattering which may or may not involve duetting. All four *Turdinus* species have simple mid-range whistles, loud and clear, delivered in series at different speeds, and sometimes with a second individual, presumed female, providing differently structured calls in duet, but the degree of stereotypy or co-ordination is unclear. The three *Napothera* species have simple clear piping whistles given at different speeds, at least two of the species sometimes duetting. The long-billed wren-babblers in the genus *Rimator* reveal their relationship to *Napothera* by singing with one brief repeated piping whistle, loud and piercing, but none of them is known to duet.

The highly sociable species in the genera *Gampsorhynchus*, *Pseudominla* and *Turdoides* have vocalizations which reflect their flocking habits. Thus, there is an absence of loud fluting and of clear piping, and relatively little, if any, duetting, since for much of the time the birds are all calling together as a group, whether in synchrony or not. *Gampsorhynchus* song has been reported as a rarely heard series of mellow low whistles, while the dominant sound is a loud harsh cackling chatter, given in groups. *Pseudominla* has a very high-pitched, very thin jumbled jingling trill for a song. With the exception of the Spiny Babbler, which has a rich, complex song giving further support to the notion that it may be better placed in its own genus (see Systematics), *Turdoides* have highly developed but relatively uniform, unmelodious vocabularies. Given that they live in groups all year around, this is perhaps unsurprising, but, even so, at least one species, the Striated Babbler, is known to perform duets.

Studies of the Jungle Babbler have discriminated eleven different vocalizations and identified both the caller within the group and the context in which they are given. (1) The "Shriek call", consisting of a short high shriek, is given by any individual at the unexpected appearance of a predator, causing the group to seek cover. (2) The "Weak Cackle call", a low intermittent wheezing, is uttered by sentinels to warn of potential but remote danger. (3) The "Strong Cackle call", a loud wheezy cackle, is given by one or more members of the group in the presence of a ground preda-

**The Puff-throated Babbler**

is a terrestrial forager, habitually rummaging among dead leaves and turning them over in search of insects. It occurs from India to Peninsular Malaysia and Vietnam, often in drier vegetation, including deciduous forests, roadside scrub, overgrown gardens, acacia thickets and bamboo. In these habitats, pairs or small groups make an audible rustling when searching for food. Some babblers hop when they are on the ground, others walk, but Puff-throated Babblers are known to use both modes of locomotion, depending on context.

[*Pellorneum ruficeps hilarum*,  
Kyobin, Myanmar.  
Photo: John & Jemi Holmes]







Many laughingthrushes are semi-terrestrial. Groups of **Greater Necklaced Laughingthrushes**, containing up to 25 individuals, band together with other *Garrulax*, including *White-crested* (*G. leucolophus*) and *Lesser Necklaced Laughingthrushes* (*G. monileger*). These unruly rabbles forage low down on a wide variety of fruits, taking them from low bushes or on the ground. They also dig for adult and larval insects, sometimes in fresh dung, as this photograph attests. Like so many babblers, this is a species of continental South-east Asia, where it is distributed widely from Nepal to China and Vietnam.

[*Garrulax pectoralis picticollis*, Hong Kong, China. Photo: John & Jemi Holmes]

tor or a perched raptor. (4) The "Group Cackle call", a loud wheezy cackle with a rising-and-falling guttural tone, is used by the entire group during confrontations with another group. (5) The "Chack call", a short "chack" uttered irregularly, is used for contact. (6) The "Cuk call", a short low intermittent "cuk", is occasionally given by a feeding individual. (7) The "Cu-cu-cu call", low and guttural, is an adult's announcement of its intention to move to a new site, and an enticement to others to follow; hence, it is used to encourage fledglings to fly. (8) The "Kya call", a loud ringing "kya-kya-kya", is an alarm summons given by a babbler when in distress. (9) The "Gurgle call", a low gurgling noise, with the wings loosely waving, announces a male's intention to copulate. (10) The "Scheer call", a low "scheer", signals submissiveness, as when a female approaches a male of another group or when one individual is dominated by another during "play". (11) The "Begging call", a rattling squawk, given by juveniles up to six months of age, intimates hunger.

Similar breadths of vocabulary are found for most other *Turdoides* that have been investigated, often, but by no means always, with contextually homologous calls. Some species, all Afrotropical ones, have petulant raucous, chattering chorus songs that act to rally group-members and advertise the group, particularly when confronting another group. That of the Scaly Babbler has the distinction of being thought one of the most grating sounds made by any passerine bird. Curiously, the only other babblers to produce a chorus song are the Capuchin Babbler (*Phyllanthus atripennis*) and the *Kupeornis* babblers of West and Central Africa.

Ongoing research is turning up interesting new evidence about the sophistication of signalling by *Turdoides* babblers. For example, different intensities and intonations of warning calls by Arabian Babblers provide remarkably precise information on the nature of the perceived threat. Further, Southern Pied Babblers have recently been shown to modify their ground-foraging contact calls as "recruitment calling", which summons nutritionally independent but inexperienced young to particular patches of food.

The Himalayan *Cutia* (*Cutia nipalensis*) sings in strings of the same loud, hard, high single note, up to 20 at a time though usually fewer. Its very close relative the Vietnamese *Cutia* (*Cutia feadleri*) has several song types, again involving strings of notes but either double ones or variable single ones. These calls, or songs, are by no means dissimilar in structure to those of the two crocias and the *Pteruthius* shrike-babblers, all of which also dwell in the

forest canopy. As with the morphological similarities of the species, however, the vocal likeness of *Cutia* to *Pteruthius* must be the result of convergence since, as already noted (see Systematics), these two genera are completely separate genetically.

The *Dryonastes* laughingthrushes fall into three subgroups which, if their vocalizations provide any guide to taxonomic relationships, present some interesting problems. The first group consists of the three beautiful rusty-and-grey species headed by the Grey-sided Laughingthrush, the song of which is loud and melodious but not yet sufficiently well known to be clearly characterized. The second group, consisting of the Black-throated Laughingthrush (*Dryonastes chinensis*) and Chestnut-backed Laughingthrush (*Dryonastes nuchalis*), delivers extremely rich, fluty and slurred songs, the birds living in pairs and being extremely territorial. The third group is made up by the six species led by the Rufous-vented Laughingthrush, all of which live in large groups and sing rather poorly, their main vocalizations being hard, shrill, scratchy twitters and rattles.

The genus *Garrulax*, ironically, does not entirely conform vocally, although all members live in fairly large groups. The seven species led by the Rufous-cheeked Laughingthrush live in large flocks in the same way as does the third *Dryonastes* subgroup, but their main vocalizations are "laughing goblin" calls, which are best known for the White-crested Laughingthrush, and from which this entire group of timaliids has acquired its English name. Greater Necklaced and Lesser Necklaced Laughingthrushes emit a much weaker laugh, and much less frequently. The Masked Laughingthrush sounds most like the White-browed Laughingthrush, a *Pterorhinus* species; both are inhabitants of open country. The remaining five *Garrulax* species, led by the White-throated Laughingthrush, deliver odd wheezy hissing or harsh squeaky snuffling guffaws. Whether these variations within the genus reflect different phylogenetic pathways or adaptations to particular types of environment remains to be clarified. It is to be observed, at any rate, that the *Melanocichla* laughingthrushes make loud hollow whooping sounds that are heard also, albeit with different qualities, from other, distantly related babblers of the lower storeys of rainforest—*Stachyris*, *Macronus* and *Pomatorhinus*—and, as these genera, they duet or even sing in trios. *Rhinocichla*, which occupies the same geographical range as *Melanocichla*, is a genus of more open forest habitats and its two members have more complex and structured strings of notes, given at a higher pitch.



Most babblers consume insects and fruit, with fruit making up the smaller proportion. Some species of high altitudes or temperate latitudes survive cold periods by switching seasonally to frugivory, while others forage on fruit when the opportunity arises. The **Brown Fulvetta**, for example, generally gleans insects, including beetles, caterpillars and grasshoppers, but will pause to eat small berries at any time of year. It is restricted to lowland evergreen forests from southern Thailand and Peninsular Malaysia to the neighbouring islands of Sumatra and Borneo, a region with minor seasonal fluctuations in climate.

[*Alcippe brunneicauda*,  
Panti Forest Reserve,  
Malaysia.

Photo: Ong Kiem Sian]



Among the brown laughingthrushes with camouflage streaks and spots there is great variation in song types. The babaxes give series of simple pleasant whistles with a thrush-like quality. The anomalous *Grammatoptila* has an outstanding rich burry song, one of the typical sounds of middle-elevation Himalayan forests. The two *Stactocichla*, inveterate skulkers in the densest of thickets and therefore, inevitably perhaps, birds that live in pairs, not in parties, have sensationally rich, mellow, complex and melodious songs, often involving mimicry; tape playback induces a state of vocal warfare. These songs are considerably richer than those of the two hwameis in *Leucodioptron*, which are so well known and loved for their song, a rich warble, faster and more slurred than that of *Stactocichla* but also often involving mimicry. This is true, at least, of the Chinese Hwamei, the song of which is considerably more intricate than is that of the Taiwan Hwamei, with the unfortunate outcome that Chinese Hwameis have been imported into Taiwan in high volume and many have escaped, leading to the danger of genetic and phenotypic swamping of the island endemic. The five *Strophocincla* have several song types each, generally including a short one, loud and clear, and a longer one, more complex and trilling. In the case of the Striped Laughingthrush (*Strophocincla virgata*), two types can be sung antiphonally, possibly one by the male and the other by the female, and this is true also of the Streaked Laughingthrush. The situation with the three other species in this genus is less clear, but duetting is performed by all of them.

The two rather featureless laughingthrushes of the genus *Pterorhinus*, birds of very open scrub and brushwood habitats, have shrill, simple vocalizations, although the least distinctive, the Plain Laughingthrush, compensates by having the most developed song, a rather sweet warble. Songs of the considerably more patterned *Ianthocincla* laughingthrushes, which live in deeper forest cover, are loud, clear and rather thrush-like, with rich, fluty, mellow notes; in the case of the Barred Laughingthrush (*Ianthocincla lunulata*) and the Spotted Laughingthrush, at least, some form of duetting takes place, the presumed female contributing quavering churring notes. The large genus *Trochalopteron*, with 16 species, possesses rather uniform songs, despite the great variety of plumages present. All of these consist of repeated short phrases of two or three loud, clear, rather thin, high whistles, often slurring up or down, liquid and musical, and in many cases with some sort of antiphonal calling from presumed females.

The five species of *liocichla* are fairly similar in their songs. The two "red-faced" species have rather loud, clear, jolly phrases and sound most melodious, the newly discovered Bugun *Liocichla* (*Liocichla bugunorum*) giving a fluty song of similar length, the Grey-cheeked *Liocichla* (*Liocichla omeiensis*) a weaker and shriller one with rather long slurred phrases, and the Taiwan *Liocichla* a quick high, short, cheerful phrase. Females of the Bugun and Taiwan *Liocichlas* often punctuate the male's song with three or four short buzzy churrs; whether this happens or is usual with the other species is not known. Recent study of Taiwan *Liocichlas* reveals that male song in duets is highly individualistic and varies significantly across different habitat types, with females more likely to duet with males in densely vegetated, steep forest habitat than in more open agricultural areas, suggesting that in this species, at least, females are duetting in order to reveal their location to their mates.

In the current taxonomic treatment and sequence, the tail end of the family consists of a number of species in their own genera, some of them clearly related to each other, some of them less obviously so, and with a concluding suite of "non-timaliid" forms (see Systematics). *Chrysominla*, *Minla* and *Siva* produce sweet, clear, high, hurried whistles, simple and *Fulvetta*-like; interestingly, *Leioptila*, while evidently a sibia, is vocally somewhat like a minla. Rather unpredictably for such colourful creatures, *Mesia* has a cheerful, loud, clearly spaced, descending short warble, and *Leiothrix*, known popularly as the "Chinese Nightingale", takes this a stage further into a longer, more complex fluty warble, rich and variable in structure, recalling, as does the song of *Pseudoalcippe*, the supposedly unrelated Blackcap of the warbler genus *Sylvia*. More predictable in terms of song is that a skulking African forest-undergrowth babbler such as *Phyllanthus* should have a pure musical whistle, although, as noted earlier, it also has raucous chorus songs of some vehemence; its relatives in the African treetops, the three *Kupeornis*, share the choruses but appear to lack any other type of song. In the treetops of Asia, however, *Crocias* has a rapid string of single notes or inflected notes for a song.

The nectar-eating sibilas fall into three genera and three vocal types. The Long-tailed Sibia in the monospecific *Heterophasia* has a simple series of notes that may serve as song, but the species is best recognized by the weird, wispy, high-pitched sounds, thin and metallic, produced by flocks. In contrast, the six *Malacias*





The genus *Turdoides* is largely made up of generalists. The *Fulvous Babbler*, for example, eats a mixture of insects, seeds, and berries. In its North African range it consumes a large quantity of invertebrates, including caterpillars, termites, beetles and grasshoppers. This diet is supplemented with fruit, chiefly *Ziziphus* and *Salvadora* berries, but also the fruit of the introduced prickly pear (*Opuntia*), pictured here. This babbler is familiar at desert camps and settlements where it will take scraps of bread and meat. It is relatively slender and quiet for a *Turdoides*, belonging to a subgenus sometimes referred to as the "chatterers".

[*Turdoides fulva maroccana*, near Goulmine, Morocco. Photo: Arnaud B. van den Berg]

sibias produce loud, well-structured songs consisting of high-pitched whistles, silvery and wavering, strident or resonant, but commonly descending in pitch at the end. As mentioned in the previous paragraph, the monospecific *Leioptila* is rather minlike vocally, but its attractive simple warbling also descends in pitch. The barwings, the genus *Actinodura*, sing in a manner that is fairly constant among the seven species, in short, clear, loud piping phrases, strident or wavering and often rather mournful. Oddly, only the Spectacled Barwing and the most recently described member of the genus, the Black-crowned Barwing, appear to have been documented as duetting, but presumably all do so to some degree. *Pteruthius* shrike-babblers string together single notes in monotonous, unmusical songs.

With the exception of the rockjumpers, all of the following species belong in monospecific genera. The White-bellied Erpornis has a curious high descending whinny, while the Fire-tailed Myzornis appears to have no song at all, individuals in groups making very thin, high, single sounds which, run together, produce a titting effect. True to its big size and chunky appearance, the *Malia* gives a raucous mix of guttural warbling and harsh grating sounds, but with one bird doing the warbling and the other the grating, and there is also a penetrating chorus call, which tends to suggest that the species may, indeed, belong in the timaliid assemblage (see Systematics). The same may be true of *Rhopophilus*, the Chinese Bush-dweller, which has a simple repeated inflected note as one song, and rich duetted calls presumably as another. The Juniper Babbler, *Parophasma*, reinforces its claim to be a babbler by virtue of the female's low churring support for the male's rich warbling trill. *Lioptilus*, the Bush Blackcap, has a loud lively jumbled song with bulbul-like phrases. From the depths of cover, the Grey-chested Kakamega gives fluty, melodious sets of phrases, warbling and liquid, the Spot-throat, *Modulatrix*, delivers loud, shrill, slurred whistlings, and the Dapple-throat, *Arcanator*, announces itself with quick, short, clear, pure melodies. The Rockrunner, *Achaetops*, sings rich clear bubbling warbling phrases from open songposts. In similar open positions, the two rockjumpers, combined in the genus *Chaetops*, utter long series of penetrating piping notes. The Principe Flycatcher-babbler, the sole member of *Horizorhinus*, gives loud

rich cheerful whistles, often in chorus, which tends to support the notion that it is a true babbler. Finally, the song of the Madagascar Groundhunter, *Mystacornis*, has a three-part structure, with two quiet high notes, a protracted mournful whistle and a harsh churr, quite unlike any "true" timaliid vocalization.

Mimicry appears to be poorly developed among babblers. The Spot-throated Babbler is described as singing "mimicked" phrases, with no further clarification, and Chestnut-winged, Chestnut-backed and Chestnut-eared Laughingthrushes (*Lanthocincla konkakinhensis*) are said to imitate other birds on occasion. The best mimics, it appears, are, in descending order of skill and/or frequency of imitation, the Spiny Babbler, which has songs very rich in mimicry, the Spot-breasted Laughingthrush and the Chinese Hwamei, three species that appear to be highly territorial and aggressive. Apart from these, the "non-timaliid" Rockrunner is reported as sometimes incorporating mimicry of other birds in its songs.

### Food and Feeding

Babblers are adapted to a broad invertebrate diet that is augmented, sometimes importantly, by vegetable matter. They are specialized for foraging on substrates in which immobile or slow-moving and often hidden invertebrates are couched. The stout bill of most timaliids is adapted to dig at, probe into and prise open surfaces in which food items may be present, including dry stems of grass, nodes of leaves, twigs and branches, curled dead leaves, old bark, rotten standing and fallen wood, epiphytic layers on tree surfaces, leaf litter and soft soil; it is used also for plucking fruits and nuts and for hammering prey items. The feet need to be fairly strong in order to support the birds in various acrobatic positions while they are foraging, and, at least in some species, including *Turdoides* babblers, laughingthrushes, the Red-billed Leiothrix and the Blue-winged Siva, to grasp and clamp food items, including nuts and hard-skinned fruit, for further processing by the bill.

As a very general rule, babblers could be said to be adapted to foraging on more aseasonal, or seasonally stable, substrates

such as dead leaves, sclerotic stems, woody vines, bark, branches, twigs, epiphytes, bases of herb clumps, fallen timber and leaf litter, but there are, of course, plenty of exceptions. All types of invertebrate are taken, with no apparent preferences, and captive laughingthrushes were ready to eat foul-smelling beetles (Coleoptera) and, once de-stinged, bees and wasps (Hymenoptera). In addition, small vertebrates are occasionally attacked, hacked up and consumed by the larger members of the family. Further, a bird as remote from human settlements as the Taiwan *Liocichla* will readily take food scraps thrown by birdwatchers from their lunchboxes, and one has been seen to eat the corpse of a conspecific.

Considering genera in terms of guilds, many babblers do, in fact, glean items from green leaves, whether in the canopy or in the shrub layer, but these birds glean also from twigs and branches, and they may be categorized as arboreal leaf-gleaners and twig-gleaners. They include the genera *Pseudoalcippe*, *Fulvetta*, *Yuhina*, *Sterrhoptilus*, *Zosterornis*, *Alcippe*, *Stachyris*, *Micromacronus*, *Macronus*, *Malacopteron*, *Ophrydornis*, *Trichastoma*, *Gampsorhynchus*, *Pseudominla*, *Rhinocichla*, *Chrysominla*, *Mesia*, *Leiothrix*, *Crocias*, *Siva*, *Pteruthius*, *Erpornis*, *Lioptilus* and *Horizorhinus*. Of these, however, *Sterrhoptilus*, *Zosterornis*, *Stachyris* and *Macronus* perhaps spend as much or more time on foraging in dead leaf tangles, *Yuhina* species also suck sugar-rich sap early in the year, *Yuhina* and *Pseudominla* glean moss-covered trunks, *Stachyris* babblers work on tree bark, and the *Gampsorhynchus* species glean bamboo-canopy leaves. Stronger specialism on dead leaf tangles is apparently displayed by the Flame-templed Babbler, *Dasyrotapha*, and all *Macronus* except the Fluffy-backed Tit-babbler, as well as by two *Stachyris* species, namely the Grey-throated Babbler and Crescent-chested Babbler. Altogether, these species account for 28% of the total in the family as presently constituted.

Several more specialized arboreal guilds exist. Babblers adapted for probing tree flowers for nectar and insects but which also probe mossy twigs and glean foliage include those in the genera *Heterophasia*, *Malacias* and *Myzornis*. Those that glean from epiphyte-bearing substrates under the canopy include species in *Staphida*, *Cutia*, *Minla*, *Kupeornis*, *Leioptila* and *Actinodura*. Specialist trunk and branch bark-gleaners appear to be

*Sphenocichla*, *Melanocichla*, *Malia* and three or four *Pomatorhinus* scimitar-babblers. Species that forage mainly or exclusively in the forest undergrowth, gleaning from leaves, stems and woody plant parts near ground level, are *Spelaornis*, *Elachura*, *Stachyridopsis* and *Timalia*. These combined account for around 16% of the family's members.

Terrestrial insectivores, here including species which may also forage in the low undergrowth 1–2 m above the forest floor, but excluding those that sometimes forage in higher strata in more open country, constitute a very large guild among the babblers. Genera represented in this include *Schoeniparus*, *Rhopocichla*, *Dumetia*, *Xiphirhynchus*, *Pomatorhinus*, *Pnoepyga*, *Ptyrticus*, *Illadopsis* (which also glean branches and trunks of trees), *Pellorneum*, *Malacocichla*, *Leonardina*, *Robsonius*, *Kenopia*, *Ptilocichla*, *Turdinus*, *Gypsophila*, *Napothera*, *Rimator*, *Stactocichla*, *Leucodiotron*, *Sterrhocichla*, *Pterorhinus*, *Ianthocichla*, *Trochalopteron*, *Liocichla*, *Kakamega*, *Modulatrix* and *Arcanator*. Species in *Illadopsis* also glean branches and trunks of trees. Some 34% of the family are represented in this guild.

Several genera of large babbler are sufficiently generalist to be considered in their own guild, one which combines arboreal leaf-gleaning and twig-gleaning with terrestrial foraging, the "arboreal and terrestrial omnivores". These are *Turdoides*, *Dryonastes*, *Garrulax*, some of which are more terrestrial than others, *Babax*, *Phyllanthus* and possibly *Melanocichla*, although the last-mentioned is included above as a specialist bark-gleaner. These constitute 19% of the family's members, leaving the final 3% to a few anomalous species. These last few comprise the three "non-babbler" genera (see Systematics) *Achaetops*, *Chaetops* and *Mystacornis* that feed exclusively on the ground, something that no "true" babbler appears to do, two open-country monospecific genera which glean mainly from the woody parts of plants, namely *Chamaea* and *Rhopophilus*, and the acrobatic grass-stripping *Chrysomma* and *Moupinia*. *Rhopophilus*, however, feeds also on the ground.

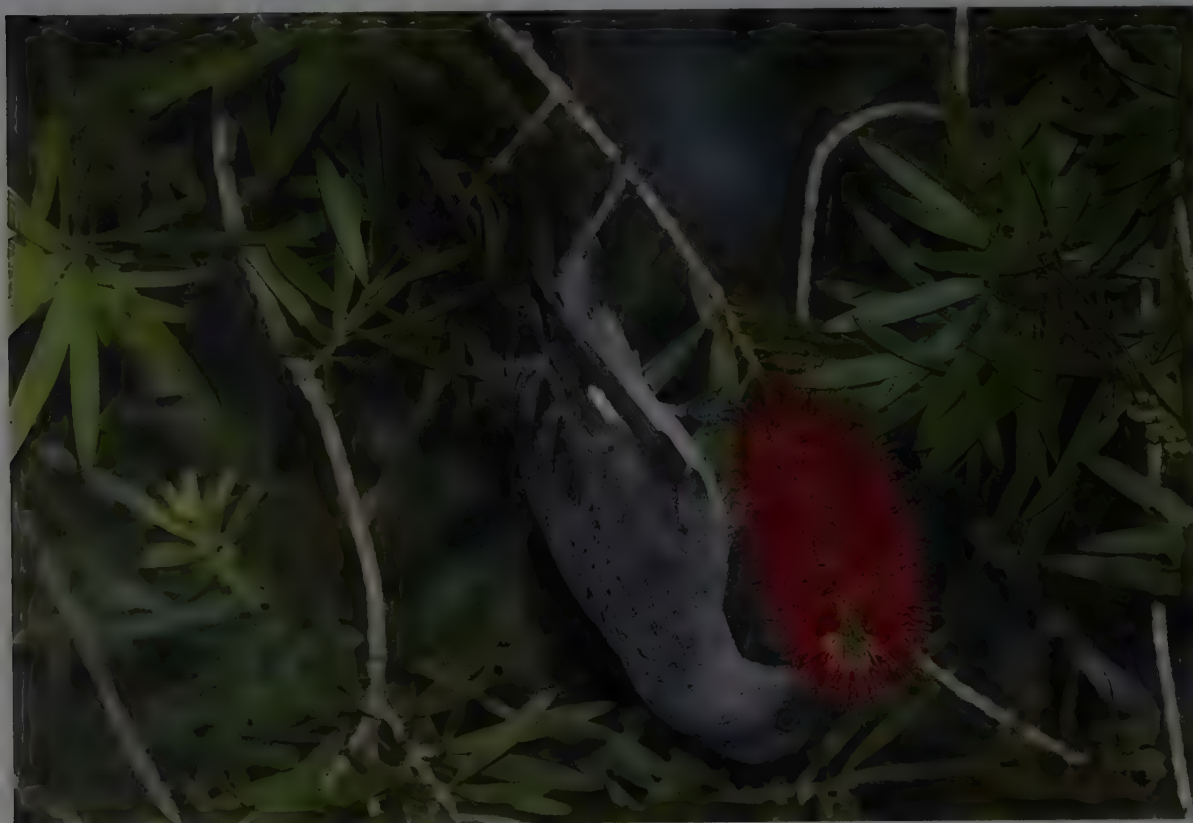
Berries, fruits and seeds are probably exploited mainly opportunistically and seasonally, but certainly more than as mere supplements, and in some cases they are major year-round components of the diet, as is so for certain *Turdoides* babblers in the Indian Subcontinent. The family's foraging specialization on sea-

Although its plumage is drab, the **Arabian Babbler** is a confident and colourful character. It has been the subject of long-term field studies and therefore its diet is relatively well known. It hunts for a wide variety of insects (crickets, beetles, caterpillars, wasps, etc.), invertebrates (spiders, scorpions, centipedes, etc.), and vertebrates; the last include lizards, geckos, snakes, and perhaps small mammals. It also eats nectar, petals, leaves, fruit and seeds, sometimes visiting cultivated crops. This individual has taken a liking to a cob of maize.

[*Turdoides squamiceps*  
*muscatensis*,  
Sohar, Oman.  
Photo: Hanne & Jens  
Eriksen]







The sibilas show varying degrees of nectarivory. They use strong legs to reach nectar-bearing flowers, usually in a wide variety of canopy trees, including *Bombax* and *Erythrina*. They also visit flowering shrubs in clearings. This **Long-tailed Sibia** is visiting gardens to glean nectar from the flowers of an introduced Australian bush, the bottlebrush (*Callistemon citrinus*). Parties of this sibia are more typically encountered in the canopy of montane forest, where they associate with large mixed-species flocks, and eat a variety of insects, flower buds, fruits, berries and seeds.

[*Heterophasia picaoides* wrayi,  
Fraser's Hill, Malaysia.  
Photo: Jimmy Chew]

sonally stable substrates predicates its adaptation to seasonally stable conditions more generally, and hence to year-round occupation of areas and habitats. Frugivory, by providing a key component of the diet in colder or drier periods when invertebrate abundance dips, further aids the decoupling of babblers from the need or ability to migrate other than in the form of vertical movements, which can be undertaken slowly and in piecemeal fashion. A self-reinforcing circle of adaptation comes into play: birds lose the need to fly great distances to forage, so they are compelled to diversify and specialize *in situ*, resulting in many cases in weak dispersive abilities, including shortened wings, which not only inhibit the colonization of seasonally favourable habitats but also encourage the development of group-living and cooperative breeding (see Breeding).

Of course, in some equatorial regions where seasonal variation is minimal, there are species that are, so far as is known, entirely insectivorous. *Malacocincla* and *Trichastoma*, for example, are genera for which no evidence of vegetable matter in the diet has been reported. On the other hand, a small number of species go to the opposite extreme. One, the Juniper Babbler of Ethiopia, appears to have been recorded as eating only fruit, mainly juniper berries, although it doubtless takes also insects at times, perhaps especially when feeding young. Another, the Spotted Laughingthrush, is reported as being almost entirely vegetarian except when feeding young, but, again, this possibility requires closer study. Several other higher-elevation *Lanthocincla* and *Trochalopteron* laughingthrushes probably have high proportions of fruits and nuts in the diet, since they live in places where annual temperatures and conditions fluctuate the most.

A study by Simmons of one species, the Rufous-chinned Laughingthrush, in captivity showed, however, that even within the realm of frugivory there is a degree of specialization. A pair of these timaliids proved to have a great interest in acorns, which the two either ate or buried, as they did also, incidentally, with peanuts after having shelled them. An individual would use its bill to ram the acorn into the ground, and then quickly hammer it more deeply in, after which it would often fetch a leaf, bits of earth, a small twig or other item and push this into the aperture above the acorn; following this, it would use its bill to make earth from the aperture wall collapse inwards, then rake the site

over with its bill and, sometimes, add a final leaf to the spot. Clearly, such caching behaviour, independently observed to be practised by other captive *Garrulax* species, too, indicates an important adaptation which may be widespread among the larger laughingthrushes of more seasonal habitats, although nothing is known of the way in which food-caching by a gregarious species functions. For example, no information exists on the period of time between burial of the food and its retrieval, and it is not known whether it is always retrieved by the individual that buried it.

There have been no detailed comparative studies of the diets of closely related sympatric and syntopic babblers other than three or more involving three *Turdoides* species, the Yellow-billed, Jungle and Common Babblers, in the Indian region. Where Yellow-billed and Jungle Babblers co-occur, they separate their feeding niches distinctly, the smaller Yellow-billed undertaking far more arboreal foraging and the larger Jungle far more terrestrial foraging. Where Jungle and Common Babblers occur together, the latter being even smaller than the Yellow-billed Babbler, their diets exhibit distinct differences attributable, at least in part, to bill size: the large bill of the Jungle Babbler allows it to take grasshoppers (Orthoptera) and fruit with high efficiency, whereas the small bill of the Common Babbler enables better handling of beetles and of grains of pearl-millet (*Pennisetum glaucum*).

Studies of the Spiny Babbler have revealed an entirely expected pattern in diurnal foraging activity, and one probably typical for most species. The birds begin feeding soon after dawn and reach a peak of activity at around 08:00 hours, thereafter declining steadily towards the midday low between 11:00 and 14:00 hours, when feeding is only occasional. In winter, when the average daylength is 11 hours, and in summer, when it is 13 hours, foraging intensity increases from 14:00 and from 16:00, respectively, and continues until dusk. A similar pattern is found for the Taiwan Liocichla. The average weight of adults of this species is significantly lower during the breeding season than outside it, presumably in part owing to the stresses of feeding young birds and in part because thermoregulatory considerations require higher body mass in colder conditions than in warmer ones. Also on the island of Taiwan, in what is apparently the only study of seasonal differences in foraging patterns of a babbler, it

Very few babblers are known to drink, but this is presumably because few reports ever find their way into print. In some arid-country species the need for water is apparently obviated, although they will visit temporary water sources after rain. Meanwhile, forest babblers, such as the **Black-throated Laughingthrush**, probably drink on a regular basis at rivers and pools, particularly where these are shady and secluded. One timaliid has even been noted to drink from the cups of pitcher plants.

[*Dryonastes chinensis*  
*lochmius*,  
Phu Khieo Wildlife  
Sanctuary,  
Thailand.  
Photo: Kanit Khanikul]



was found that the White-whiskered Laughingthrush (*Trochalopteron morrisonianum*) foraged in different parts of the habitat at different seasons, presumably mainly in response to plant phenology. Thus, during the breeding season, the birds foraged both lower and higher than in the non-breeding season, on both shorter and taller plants and smaller and larger trees, and along smaller branches, and they consumed more invertebrates, flower petals and larger food items; moreover, throughout the year, males foraged more often above 8 m than did females.

Foraging flocks of particular species of babbler can move very swiftly from site to site, or they may move very slowly. Size and guild seem to matter here. Small arboreal leaf-gleaners and twig-gleaners tend to be faster-moving, sometimes, indeed, with bewildering speed. The Yellow-throated and Rufous-winged Fulvetas are two such species, and the Chestnut-collared Yuhina is another. The last-mentioned has a predilection for aphid-infested trees, and could it be that at certain times of the year the flocks trap-line when they forage? They certainly must cover relatively large distances in a day, and they belong to the only babbler species known to have irruptive behaviour (see Movements).

In contrast, some of the larger species take their time, especially when foraging on the ground, up to 20 or sometimes more individuals working their way methodically over a patch of forest floor covering several hundred square metres, the operation lasting for many minutes. In the case of some *Turdoides* babblers, notably the skulking "chatterers", the foraging group works its way out into open terrain from the base of thick cover, searching unobtrusively for food, often with one bird posted as a sentry against potential danger, which is a general feature of *Turdoides* (see General Habits), although apparently unreported for other genera. The birds tend to keep within 10 m or so of their nearest group-member, and remain in constant contact by means of low-volume calls. In one study of Yellow-billed Babblers, the average speed of flock movement in the rainy season, with denser vegetation and greater fruit abundance, was 105 m per hour, whereas in the dry season this increased to 134 m per hour, although in a study of the more arboreal Jungle Babblers in the non-breeding season the average speed was 200 m per hour and, on the other hand, groups of ground-foraging Giant Babaxes moved only 300–400 m over the course of an entire day.

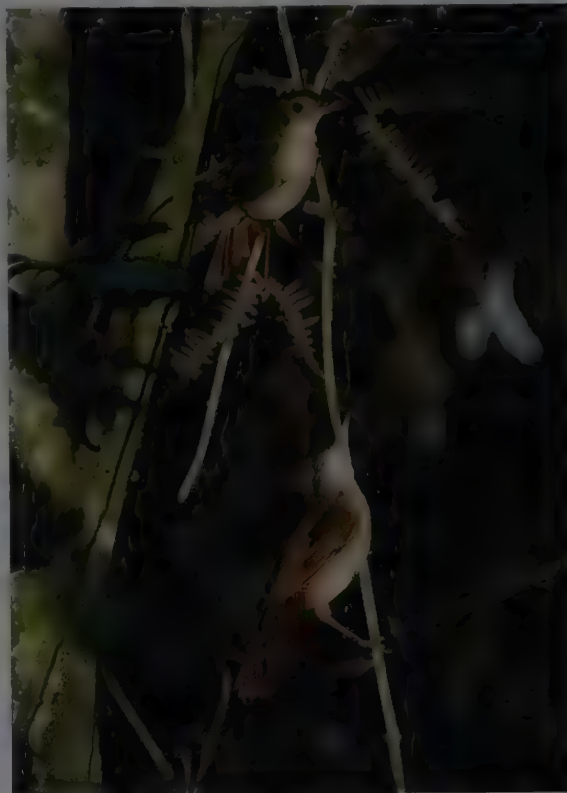
It is not particularly clear if babblers in monospecific groups defend territories and, if they do, the methods that they use. The smaller, faster-moving species may not do so at all. A study of Grey-cheeked Fulvetas on Taiwan revealed extensive overlap in the home ranges of groups, with no apparent territorial defence; the size of home ranges of this species varied from 17.8 ha to 31.8 ha. Even the aggressive open-country *Turdoides* babblers, which fight each other on occasion, sometimes have neutral ground where groups feed together for several hours at a time without conflict, at least when not breeding. Certainly, territorial defence becomes impossible when monospecific flocks join mixed-species flocks, many of which are composed largely or completely of babblers; presumably, these "taxonomic" groupings reflect similarity of guild, and involve species with very slightly different niches within the guild. Such mixed flocks are commonest in the parts of the world where babbler species are at their most numerous, from the eastern Himalayas east to South-east Asia. Feeding flocks, however, often require a sentinel, commonly a drongo, a bird well known for its aggression, sharp eyes and distinctive warning call. The theory has been that the drongo benefits by being able to hawk insects flushed by the ground-feeding babblers, and repays this advantage by its vigilance and alarm-calling. This certainly fits the evidence from a study of Yellow-billed Babblers in India, where a nesting pair clearly profited from the presence of a Black Drongo (*Dicrurus macrocercus*), which, although once stealing food from a babbler, drove off every approaching raptor. On the other hand, recent observations in Myanmar of mixed-species flocks dominated by Greater Necklaced and Lesser Necklaced Laughingthrushes have produced evidence that the dynamics of the relationship are less straightforward. There, the Greater Racket-tailed Drongo (*Dicrurus paradiseus*) commonly occurs with a foraging group of the babblers and, indeed, it often gives alarm calls which alert the group to the presence of predators; far from using the foraging flock as "beaters" for its own aerial sallying, however, it also simply harries flock-members for prey that they catch, in some cases chasing an individual for over a minute, striking it in flight and driving it to the ground. The trade-off for the laughingthrushes is evidently worthwhile, although it is difficult to know what they could do about the situation.



The more aggressive *Turdoides* babblers have a solution to this. Although, as just noted, they supply their own sentries, it is clearly more efficient if another species fulfils this function. In South Africa, however, the Fork-tailed Drongo (*Dicrurus adsimilis*), which frequently attaches itself to groups of Southern Pied Babblers, has taken the game one step further. Instead of harrying its companions, it gives an alarm call, a "false alarm", when it sees a prey item about to be taken by one of them, causing the babblers to fly up while it swoops down to steal the item for itself. For small groups of babblers, the benefit of the drongo's services just outweighs the cost of this kleptoparasitism, and the bird is tolerated. On the other hand, for large groups of babblers, in which sentry duty can easily be rotated with little loss to any individual, the drongo becomes surplus to requirements and the babblers drive it off.

In the case of the drongos, it seems well agreed that it is they that seek out the babblers, rather than the reverse. In the case of the mixed babbler flocks in tropical forest, it is possible that there is a general advantage to all participants, and that the convergence happens through a common self-interest. In Sri Lanka, however, the Orange-billed Babbler is a major nuclear species for mixed flocks of birds of any species in Sinharaja Forest, being present in most flocks and then always leading them, but the extent to which it profits by the company is unclear. In the open savannas of Africa, at any rate, there is some evidence that the trade-offs among *Turdoides* babbler species may be more lopsided. Thus, Southern Pied Babblers and the slightly smaller Arrow-marked Babblers have been seen while foraging together in the same group on occasion, but at other times they have been recorded as fighting fiercely, indicating that different degrees of sociability must be determined by different environmental conditions. Similarly, groups of Rusty Babblers commonly follow groups of the larger Brown Babbler, foraging behind and occasionally with them, but always subordinate to them, and from this evidence it would seem that the greater advantage in the association is for the Rusty Babbler.

Apart from their frequent participation in forest bird waves, babblers have been found to exploit other animals in some way as beaters or as sentinels. Rusty Babblers have been seen to join company with francolins (*Francolinus*) and other unspecified birds. Sharpe's Babblers, too, are recorded as associating with francolins, and also with ground-foraging *Lamprotornis* starlings,



Courtship displays of timaliids are varied, generally modest, and poorly known. No display has been described for the **Ferruginous Babbler**, but it is possible that the "sky-pointing" individual in this photograph is involved in some sort of display. Several babbler species are known to cock their heads or point their bills upward during courtship or agonistic behaviour. The most dramatic timaliid displays are seen in species with elongated plumes, such as *Macronus*, or coloured neck-patches, such as *Stachyris*.

[*Trichastoma bicolor*,  
Johor, Malaysia.  
Photo: Morten Strange]

*Campethera* woodpeckers, wood-hoopoes (*Phoebastria*) and *Tockus* hornbills. Southern Pied Babblers form associations with Red-billed Buffalo-weavers (*Bubalornis niger*) and Crimson-breasted Shrikes (*Laniarius atrococcineus*), and have been seen to kleptoparasitize a Brown-headed Tchagra (*Tchagra australis*) and to be kleptoparasitized by hornbills. Brown Babblers often join bird flocks but also associate with parties of dwarf monogeese (*Helogale parvula*). In south Asia, Orange-billed Babblers and Yellow-billed Babblers associate with *Funambulus*



As a general rule, both sexes of babblers contribute to parental duties such as nest-building, incubating eggs, and rearing the brood. Most babbler nests are cup-shaped, but many are domed, especially in those species nesting close to the ground. Thus, the **Spot-breasted Scimitar-babbler**, like most other *Pomatorhinus* species, builds a loose dome with a broad side-entrance. The structure consists of coarse plant fibres such as grasses, dry ferns and leaves. It is placed on the ground, or low in a dense bush, and lined with fine grass and rootlets.

[*Pomatorhinus mccllellandi*,  
Cangshan, Dali,  
Yunnan, China.  
Photo: John & Jemi  
Holmes]



The **Pin-striped Tit-babbler** builds a ball-shaped nest from dead grasses and leaves (often including bamboo), bark strips, palm strands, and a range of other plant debris and fibres. It usually places this structure in dense low vegetation such as bushes, ferns, vines or bamboo. The individual pictured here seems to have snapped off a piece of dead leaf, perhaps with the intention of incorporating this item in the nest. Alternatively, it may simply be removing debris while foraging; aerial dead leaves are favoured feeding stations for this species, along with several other babblers.

[*Macronus gularis gularis*,  
Panti Forest Reserve,  
Malaysia.  
Photo: Teo Nam Siang]



squirrels, and in Sulawesi the Malia does this with other species of squirrel. Back in Africa's tropical forests, the Brown Illadopsis sometimes attends driver-ant columns, and often follows the ribboned rope squirrel (*Funisciurus lemniscatus*).

If the animals with which timaliids associate are used more as beaters than as sentinels, which is incontrovertibly the case with the ants, at least, it has to be said that very few babblers appear ever to indulge in aerial sallying. Yellow-billed, Common and Spiny Babblers do so occasionally, as do the Wrenit, the

White-chested Babbler, the Silver-eared Mesia, the Red-billed Leiothrix, the Fire-tailed Myzornis and the Principe Flycatcher-babbler. The Rufous Sibia has been known to flycatch in captivity, and perhaps all sibilas indulge in this behaviour at times. On the other hand, the habit of jumping to snatch food items, such as overhanging fruit or an insect on an overhanging leaf or branch, is quite widespread in the family.

Drinking is poorly documented for babblers. Many members of the family may not need to do so. Southern Pied Babblers survive in certain areas without drinking, but where they get the chance to drink they take it. Brown Babblers drink during the day and before they go to roost: the flock approaches the drinking pool cautiously, using the cover of thick vegetation, the birds then either all emerging at the water's edge in a row or else drinking one at a time from an overhanging branch. On Luzon, in the Philippines, a Chestnut-faced Babbler has been seen to drink from a pitcher-plant.

Within groups of *Turdoides* babblers, at least, the feeding of one individual by another is an important phenomenon. This behaviour, known as allofeeding, has already been dealt with in some detail (see General Habits). Courtship feeding, another form of allofeeding, is mentioned below (see Breeding).

## Breeding

For most babbler species, it appears that breeding is predictably associated with increasing daylength and temperatures in much of the Northern Hemisphere. At the equator the pattern is less predictable, and breeding may occur in any month, but with greater likelihood at the start of the rains. Study of *Turdoides* babblers in India reveals that, while rains-driven food availability accounts for the timing of breeding in some areas, it does not in others, perhaps owing to the nature of the rain—too hard and continuous in open country to allow for efficient foraging, in spite of the insects that emerge. Babblers in India show two breeding peaks per year, one in spring, probably in response to spring leaf-flush, and the other between mid-summer and autumn, probably in response to monsoon rains.

With these Indian *Turdoides* babblers, non-breeding flocks can sometimes be big enough that they break up into smaller breeding groups which remain on the flock territory and breed

Co-operative breeding is the norm in many group-living babbler genera, including *Turdoides*. In the **Fulvous Babbler**, for example, breeding groups are composed of a monogamous pair assisted by one or two subordinate individuals, usually the offspring of the dominant pair. These helpers contribute to nest-building, incubation, defence against predators, and the feeding of incubating birds, nestlings and fledglings. In this species, as with other *Turdoides*, the nest is a loose cup of twigs and dry grasses, usually placed fairly low in dense thorny bushes.

[*Turdoides fulva fulva*,  
Tunisia.  
Photo: M. D. England/  
Ardea]





independently of each other, but not simultaneously. The many other babbler species that form large winter flocks have not been studied in sufficient detail to determine the pattern of their break-up into smaller constituent groups and pairs, but in some cases there are reports of flocks persisting while some birds begin breeding; these flocks perhaps consist of younger individuals that will not breed at one year of age, or of later-breeding birds. The dynamics of flock break-up, however, appear engaging, as anecdotal evidence concerning the Bar-throated Minla suggests. With this species, flocks of 15–50 individuals have been seen to separate into pairs, all of which remain together in the same tree, the partners of each pair snuggling side by side while facing in opposite directions on a branch, and separated by at least 15 cm from the next pair. Then, with churring and whistling, they alternately bow and stretch the head to the fullest extent, the feathers of the head and neck fluffed out, and frequently reverse their positions, shifting at the same instant so that the two tails are never on the same side of the branch. This can continue for an hour or more without a break, each pair normally ignoring the others, but an individual occasionally leaving its partner and starting to bow to the nearest bird of the next pair, which leads to much scuffling and disturbance.

To the human eye and mind, a flock has a certain informality and randomness, to do with its seemingly variable composition and arbitrary movement through a habitat, which encourages the assumption that individual relationships within the flock may be rather secondary considerations, and that pair-bonds may not be particularly strong or long-term. That this is probably a mistaken notion is suggested by a study of Taiwan Liocichlas, in which it was found that established pairs join winter flocks every day, one hour after dawn, and break down into pairs again after sunset, thereby giving the daytime human observer something of an illusion of the relative importance to the species of group-living over pair-wise association. Studies of other flocking species, in captivity, have suggested that the pair-bond is very strong. Gibson considered that the Red-billed Leiothrix mates for life, and found that members of pairs were extremely protective of each other; one female seemed to nurse her mate back to health after he lost half of his scalp and eyebrow in a scrap. Gibson pointed out that single birds are always nervous and unhappy in aviaries, and that they need to be kept in pairs. Interestingly in this regard, an early

fieldworker in Myanmar, T. R. Livesey, reported of the Dark-backed Sibia (*Malacias melanoleucus*): "I very reluctantly had to shoot a few specimens to authenticate the eggs I took, and for scientific purposes. In doing so the distress shown by the mate of the bird I had killed induced me to shoot it also." Among Wrentits, it has been found that more than 95% of individuals mate for life, the pair-bond usually forming in the first winter of life, between late autumn and early spring. Paradoxically, it may be that it is the very strength of the pair-bonds in babbler flocks that promotes their coherence and stability.

Apparently, only one species of babbler, the Blue-crowned Laughingthrush, has been found to be loosely colonial when breeding, but this trait may prove to be true of certain other timaliids, particularly those which have little or no song. Despite the evidence that some *Turdoides* and *Babax* species share parts of their home ranges, however, it seems that many babblers are territorial, and, at least around breeding time, strongly so. In a study of Jungle Babblers, it was found that the flock usually visited every tree in the territory at least once during the course of a day. Among both Wrentits and Taiwan Liocichlas, both sexes actively defend the territory, which is usually fairly small, in the case of the latter species only some 0.6 ha, and irregular in shape according to the landscape, while that of the Scaly-breasted Illadopsis is about 0.8 ha and the birds are sufficiently site-faithful to be found in the same territory for at least three years. Wrentits use song as a key indicator of occupancy, the male visiting preferred singing perches throughout the day. When intruders are detected, both members of the pair quickly fly to the vicinity and sing, holding the head feathers and tail erect and the wings slightly spread. Longer conflicts usually take the form of chases back and forth along the territorial boundary, but fighting, which involves wing-buffeting and bill-snapping, is rare. When greater tolerance is shown, it is likely that the individuals are related, as territorial division between parents and offspring of this species has been observed, so that offspring come to occupy adjacent territories. So deeply philopatric is the male Wrentit, however, that, once it is established on territory, a shift to another has yet to be recorded.

Territorial conflict appears much stronger with certain species than with others, but the extent to which this perception is the product of observer bias is unclear. The Madagascar Ground-



The nest of the **Golden Babbler** is a ball made of dry leaves, usually including bamboo and grasses. It is often unlined, and placed on the ground or low down in thick vegetation. The clutch comprises 3–4 eggs. Aside from these details very little has been published about the breeding behaviour of this species, despite its wide distribution and relative abundance. This paucity of information applies more generally to small timaliids, suggesting that they represent good targets for future fieldwork.

[*Stachyridopsis chrysaea chrysops*, Fraser's Hill, Malaysia. Photo: Ong Kiem Sian]

The **Golden-fronted Fulvetta** is a restricted-range species inhabiting the mossy, rain-soaked, mid-montane forests of Sichuan and Guangxi, China. Here, it builds a ball-shaped nest with an outer layer of green moss, presumably as camouflage. The inner layers and lining of the nest are constructed from the dry dead leaves of bamboo, along with other plant fibres. This structure is fitted snugly and inconspicuously amongst moss or creepers low down on tree trunks, sloping banks or in clumps of ferns or orchids. The scant information available suggests that a clutch of around 4 eggs is laid, and the chicks fed by both adults of a pair.

[*Pseudominla variegaticeps*,  
Wawushan,  
Sichuan, China.  
Photo: John & Jemi  
Holmes]



hunter is a pugnacious creature, highly territorial and often in dispute with other males, and the Cape Rockjumper (*Chaetops frenatus*) has frequent brief territorial confrontations, during which the head is held up and the tail is fanned so as to show off the conspicuous tips. Chinese Hwameis are fiercely aggressive at all times: a captive male that sees another male goes into paroxysms, quivering its wings, fluffing its body feathers, uttering low cat-like mews or standing erect on its perch, performing hula-like movements and uttering chuckling notes as it dips its tail and nods its head in rhythmic unison, or else it ostentatiously jumps up and down on the perch with much noise. In a display that seems to proclaim territorial rights, the Rufous-chinned Laughingthrush, giving a loud throaty bubbling, perches with the body held to one side, the tail pointing to the opposite side, and the head and neck stretched upwards and forwards, with the bill slightly raised; it then performs a series of rapid single pivoting and ducking movements from side to side, dipping and raising the head as it swivels the body, at the same time swinging the tail across with a vigorous jerky movement that shows off the conspicuous coloration of the throat and tail tip.

Among *Turdoides* babblers, confrontations at boundaries take the form of extended chorusing and displaying, the rivals usually 30–50 m apart. Brown Babblers partly spread their wings, bow, and fan and close the tail as they chorus, sometimes turning the body widely from side to side and flicking the wings with each call note. With Arrow-marked Babblers, flocks that cross the boundary line are quickly chased back, but, when group sizes are unequal, larger groups may cross the boundary and chase the smaller group deep into its own territory. Sometimes, as noted earlier with regard to interspecific confrontations (see General Habits), an individual from each side steps forward to take the confrontation further, and the two fight while the others look on. This has been recorded for Southern Pied Babblers and Rusty Babblers, as well as the Arrow-marked Babbler.

In contrast, courtship displays of the Timaliidae are far less well documented or understood, because they are, of course, con-

siderably less frequent and more discreetly performed. Yet the anecdotal evidence suggests that they are as varied as the plumages and shapes of the babblers themselves. Singing is for many species the primary form of display, and, as indicated earlier (see Voice), an unmated male Wren-tit has a far higher song output than a paired male. Many, and perhaps most, singers deliver their songs together with other signals. As examples, the Palawan Ground-babbler stretches its head up at 45°, the Malia cocks its tail high, the Brown Illadopsis puffs out its throat feathers and displays its white moustaches, the Black-capped Illadopsis opens its wings, the Fluffy-backed Tit-babbler jerks its back plumes, and the Striated Laughingthrush raises its crest. Both the Flame-templed Babbler and the Coral-billed Scimitar-babbler perch very upright, and the latter puffs out its throat. The Naga Wren-babbler (*Spelaornis chocolatinus*) puffs up its head and breast feathers and jerks its body up and down, while the Spotted Wren-babbler, *Elachura*, opens and quivers its wings. The Plain Laughingthrush tilts its head rhythmically from side to side, puffs out its feathers and holds its tail above its head, the Rufous-chinned Laughingthrush hunches its back, depresses its tail and puffs out its body feathers while bowing and turning around, and the Rufous-necked Laughingthrush raises the bill upwards, flicks the wings, and depresses and flirts the tail from side to side. The singing Yellow-billed Babbler spreads the tail and flicks the wings as it pivots from side to side. Finally, the Silver-eared Mesia continually flirts its wings, and the Red-billed Leiothrix quivers its wings and fluffs out its body feathers.

The two last-mentioned have courtship displays that have, apparently, been recorded only in captivity. The male Silver-eared Mesia holds a grass stem and stretches bolt upright, crown feathers erect, in front of the female. Both then raise the wings above head-height, the female also sometimes holding grass, and both slowly bow the head and bob the tightly folded tail. A male Red-billed Leiothrix, evidently somewhat earlier in the courtship cycle, danced around and around a female in the manner of certain gamebirds (Galliformes), swaying his sleeked, up-pointed head





Incubation in babblers normally begins with the last egg so that hatching is synchronous. Both males and females take part in incubation, changing over at the nest very furtively, with a minimum of fuss or vocalizing. In some species the overnight shift is always undertaken by the female. This information is lacking for many babblers, including the **Rufous-crowned Babbler**, because they are poorly known and sexually monomorphic. As with most *Malacopteron*, the nest of this species is a simple cup, usually supported by vertical stems low down in the dense understorey of evergreen rainforests.

[*Malacopteron magnum magnum*, Malaysia.  
Photo: Roland Seitre]

and forebody from side to side, showing off the throat and breast colours, and displaying the pattern of both wings by leaning towards her, lowering the near wing and raising and inverting the far wing so that it showed over his back. In a third unique observation involving a captive timaliid, a male Black-chinned Yuhina (*Yuhina nigrimenta*) crept through some bushes while holding his crest down, wings half-spread and quivering, tail spread, and flank feathers fluffed, giving him an odd flattened appearance, during all of which he made a hissing noise. Later, he sang and, on the last note of the song, rotated forwards and downwards on the perch, with wings and tail spread to their fullest extent, hanging upside-down like a miniature bird-of-paradise (*Paradisaeidae*), before returning to his original position by swinging back up in a complete circle.

Just as unexpectedly, a Striated Yuhina (*Staphida castaniceps*) soared 6–10 m into the air and then sailed down on outstretched wings to some lower bushes, presumably in a display intended to impress a watching female. There seem to be no other reports of aerial displays of this sort in the family, although lightning-fast pursuits through dense vegetation have been recorded for the Rufous Sibia, during which the male pecked repeatedly at or near the female's cloaca, and for the Sulawesi Babbler (*Trichastoma celebensis*), which ended with both sexes remaining motionless with the head held in a strange way against the neck.

Less acrobatic displays, involving bowing and nodding of the head, flirting and spreading of the wings, and constantly vocalizing, have been seen to be performed by the Black-throated Laughingthrush and Greater Necklaced Laughingthrush on the ground. A captive Masked Laughingthrush, while collecting nest material, fluffed up the head and flank feathers and held the body horizontal so that the chestnut coloration of the ventral area was emphasized, almost as an invitation to copulation. Two courting Chestnut-winged Babblers sat 0.5 m apart on branches about 3 m up, where they pointed the bill upwards, displaying the bright blue throat patches, and uttered a long series of soft *Stachyris* "poop" calls (see Voice), and two courting individuals of the closely related Chestnut-rumped Babbler raised and lowered the head and bowed deeply to each other. In another interesting courtship display, a male and female of the Madagascar Groundhunter

strutted silently around each other in meandering circles for several minutes, the tail cocked vertically, looking like miniature rails (*Rallidae*). The Thrush-babbler is reputed to display in a little arena, but this requires confirmation.

Courtship feeding is practised by babblers, but how widespread it is in the family is not known. It is regularly performed by the Brown Illadopsis and the Spiny Babbler, and has been observed several times in captive White-throated Laughingthrushes, the female approaching the male in a slightly crouched posture, with the feathers fluffed and wings shivering as she was fed. When a male Southern Pied Babbler caught a large grasshopper on the ground, he was quickly joined by a female, which took the prey and ate it, and the pair then copulated. Copulation itself is not commonly seen or, at least, has been infrequently documented for timaliids. It takes place very rapidly in the case of the Chestnut-collared Yuhina and very unostentatiously in the case of the Fulvous Babbler, although single observations of such activities do not necessarily, of course, reflect normal events. Lack of ostentation, however, is certainly a feature of copulation among Arabian Babblers, the female of which deliberately leads the courting male to a secluded spot in order to test the degree of his dominance. If another male follows and is not fully challenged and driven off, she then knows that a question-mark hangs over the first male's control of the group, and she may well then make herself available to his "second-in-command" while still in her fertile period.

Among most *Turdoides* babblers, breeding is co-operative, with usually several helpers at the nest, these generally consisting of offspring of the dominant breeding pair. These helpers contribute to the breeding effort in various ways, by supplying nest material, incubating, bringing food to the nest, including to the incubating female, keeping watch, and supporting the offspring, but the amount and type of assistance varies with species, context and status; among certain Indian *Turdoides*, for example, first-years may do many helpful things, but they never take part in incubation. Moreover, there can be interesting complications, as when two females lay in one nest or one female lays a clutch sired by two fathers. As mentioned previously (see General Timaliids), some 14% of the Timaliidae remain in groups all year, and many of these species are likely to be co-operative breeders. The

Babbler chicks hatch blind and naked, sprouting feathers around four days after hatching, and opening their eyes perhaps a day later. The nestling period tends to be relatively short in many small or medium-sized species. In the **Yellow-eyed Babbler**, 3–5 eggs are incubated by both sexes, and once these have hatched the chicks are fed, again by both sexes, for a further 12–13 days. The nestlings shown here appear to be around ten days old, and equal in size due to synchronous hatching.

[*Chrysomma sinense hypoleucum*,  
Karnataka, India.

Photo: Vivek Sinha/VIREO]



Cape Rockjumper is a facultative co-operative breeder, and this appears to be true also of the Giant Babax, where helpers do no more than defend the nest. Perhaps no timaliid species is obligate to the point of being unable to breed unless a group is involved, although the willingness of captive Blue-crowned Laughingthrushes to assist in the rearing of the young of other species with which they are housed suggests a high degree of "hard-wiring" which may, in fact, be typical of many of its relatives.

The most extraordinary breeding system yet discovered among the babblers is that of the Taiwan Yuhina. In this species, each group consists of 1–3 communally nesting, socially monogamous pairs, some with a single unmated helper, and each is headed by a male the head, wing and tail lengths of which exceed those of other males in the group, and which alone sings in territorial defence. Female rank relates not to body size but simply to her mate's rank. More than one female lays eggs in the nest, and in one study 20% of offspring were from inter-group extra-pair fertilization, which was detected in 50% of all broods, and a further 20% of offspring were from intra-group extra-pair fertilization, found in 67% of all broods. New individuals joining parental groups are either male offspring from previous breeding seasons with a non-relative mate, or an unrelated pair. Larger groups do not have higher nest success rates, nor do they produce more fledglings, but, instead, they reduce their investment in each breeding attempt by laying fewer eggs, thereby lightening the group workload of incubation and food-provisioning. Apart from *alpha* males, individuals in larger groups have higher survival probabilities, this being especially so for females, because their incubation load is much lighter. Larger groups may also build nests and reneest faster than do solitary pairs, and occupy better-quality home ranges in terms of possible nest-sites, food availability and tree cover.

For most babblers, the roles of nest construction, incubation of the eggs, and brooding and feeding of the young are shared between the male and the female, although the relative proportions vary with species and individuals and also with time. Nests are usually open cups, some shallow, some deep, lined with roots and fine stems and camouflaged with moss and lichen. Those species that nest closest to the ground have a domed nest: thus,

members of the genera *Pomatorhinus*, *Pnoepyga*, *Macronus* and probably *Rimator* normally or always add a dome, and species in *Stachyris*, *Stachyridopsis* and *Pellorneum* often do so. The size of the nest and the size of the bird may determine the time taken in the making of the structure; at least, the Grey-cheeked Fulvetta constructs a nest in 3–4 days and the Black-chinned Laughingthrush (*Strophocincla cachimans*) in 7–15 days. Replacement nests, after loss of the first nest, are usually built much more quickly. In co-operative *Turdoides* babblers, the number of helpers appears to have no effect on the speed of construction. A Wrenit's nest, taking 3–10 days but normally 6–7 days to build, involves four stages: the building of a cobweb framework, of the platform, and of the walls of the cup, and the adding of the interior lining. The Dark-fronted Babbler, confined to southern India and Sri Lanka, appears to be unusual, and perhaps unique in the family, in building many "cock-nests" (unlined nests that may or may not be selected for true nesting), so many in fact that one observer originally thought that the species was colonial. It is not known, however, if these are built only by the male, as the term "cock-nest" implies.

The limited evidence suggests that, after the nest is completed, there is a short lull, as with other passerines, of up to three days before the first egg is laid. Black-chinned Laughingthrushes lay their eggs between 06:00 and 08:00 hours on successive mornings. The eggs are highly variable in coloration, from pinkish-white to rich greenish-blue, buffy cream and reddish-brown, with or without maculations, but the shells commonly have a fine-grained texture producing a smooth surface with variable gloss. Clutch size varies more predictably with latitude. For example, many tropical species lay only two eggs, but there is a general tendency towards larger clutches in more northerly species, with six eggs recorded for such species as the Chinese Babax (*Babax lanceolatus*), the Plain Laughingthrush and the Chinese Bushdweller, although the *Turdoides* babblers often do better still, perhaps because more than one female is involved. In the case of both the Wrenit and the Taiwan Liocichla, each egg weighs about 13% of the adult female's body weight.

Incubation begins with the last egg, except for some *Turdoides* babblers. The Arrow-marked Babbler begins with the first egg.



At nests of the Wrenit, the female incubates for longer spells than those contributed by the male, and she sits also at night, the male taking the first and last daytime shifts to allow her up to 30 minutes of foraging. Change-overs are normally preceded by a single or double song by either sex, and the birds often approach and leave the nest along the same concealed route, very surreptitiously. All of this is probably typical for other babblers, and is supported by evidence from studies of the Taiwan *Liocichla* and Grey-cheeked *Fulvetta*, but apparently it is only the female that incubates at nests of the Pale-breasted *Illadopsis* and Abbott's Babbler. With the Black-chinned Laughingthrush, fresh eggs weigh 5.2 g, falling to 4.2 g on the 15th day of incubation, and hatchlings weigh 3.5 g.

After hatching, nestlings of the larger species are brooded intensively in the first few days, at least. Black-chinned Laughingthrushes decrease the amount of brooding daily through to day 7, and thereafter, for a further seven days or so, they brood only weakly, and often simply to keep the chicks dry during rain. Similarly, the Taiwan *Liocichla* broods until day 8. The Wrenit, however, broods its chicks until they leave the nest. Presumably, size is important, such that the smaller the chick the greater the thermoregulatory need. Both sexes feed the nestlings at intervals of 15–30 minutes, this decreasing to as few as five minutes towards the end of the nestling period. There are various other statistics. For example, in 65.6 hours of observation at a nest of Snowy-cheeked Laughingthrushes, the parents fed their seven-day-old nestlings 521 times at a combined frequency of 7.9 times per hour, increasing from 3.2 per hour on the first day to 11.05 per hour on the day of fledging; 35.9% of the provisioning was done by the male and 58.3% by the female, the remainder being unknown, and faecal sacs were removed at a rate of 6.9 per hour. Most babblers, incidentally, swallow the sacs of their nestling. In a study of Arrow-marked Babblers, the young were fed by all members of the group, but unevenly: in one instance, 74% of feeds were delivered by three adults and 26% by another three, and each nestling received 1.3–4.4 feeds per hour, the average being 2.4 feeds. Although helpers make no difference to the speed of nest construction, they do have an influence on the speed of nestling development, such that larger groups fledge their young sooner than do smaller ones. With Arabian Babblers, it has been

suggested that these fast-growing young are the beneficiaries of a serious competition among their food-providers, since provisioning is used also as a means of establishing rights of possession and of improving social status within the group.

Blind and naked when they hatch, babbler chicks begin to sprout feathers on or around day 4 and open their eyes on day 5, progressing as do other passerines. The nestling period of both the Wrenit and the Yellow-billed Babbler is roughly 14 days. Birds of most species, even the Wrenit, may not be able to fly properly at this age, but, being out of the nest, they are capable of clambering around adeptly in twigs and branches. The average weight of fledgling Taiwan *Liocichlas* is 20.5 g, equivalent to 68% of the adult female's weight. An Arrow-marked Babbler in captivity left the nest at 14 days, when it weighed 46 g, 53% of the adult weight. It could fly a little at 16 days, and by 20 days it flew fairly well, but it did not sit out in the open until it reached 26 days, at which stage full feather growth was complete, and it was still being fed by the parents at 45 days. Grey-cheeked *Fulvettas*, the nestling period of which is only around nine days, feed their fledglings for 40–65 days after the latter have left the nest, and Wrenits feed theirs for up to 41 days. In the case of the Wrenit, young from different broods often move together in groups of up to five individuals, from ten weeks after fledging.

The Black-chinned Laughingthrush has been found to pull its nest to pieces after the fledging of the young, or if it is robbed or discovered and disturbed before egg-laying, and the species will even destroy other nests in the same tree. Although this habit appears to be unrecorded for other species, it may be an anti-predator device. Predation is certainly the main cause of nest failure among babblers, which have developed a wide repertoire of distraction displays by way of response. A Spot-necked Babbler near its nest scurried along the ground with its wings outspread and its back feathers ruffled, and a Chestnut-rumped Babbler rapidly hopped along with both wings raised vertically above its head, as if it was unable to fly. At least two species of *illadopsis* perform the "rodent-run", and the Black-capped, Brown-capped and Abbott's Babblers all perform broken-wing displays when disturbed at the nest. Further, and most remarkably, when one breeding adult Coral-billed Scimitar-babbler was mist-netted, two others of the species circled around the observers while making



*Reinwardt's Babbler* is a typical *Turdoides*, breeding in co-operative groups and raising small broods of 2–3 eggs in bulky open-topped nests. There are no data about provisioning in this species, but in congeners the young are fed unevenly by all group members. Some adults, and not necessarily the parents, contribute the bulk of provisioning visits, and each nestling receives 1–4 feeds per hour. It has also been shown that larger groups provide food at a higher rate than smaller groups, resulting in shorter nestling periods, and a consequent reduction in predation risk.

[*Turdoides reinwardtii*  
reinwardtii,  
Fajara, Gambia.  
Photo: Michael Gore]



scolding calls and feigning injury, a strange reaction unless, perhaps, the captured adult was in fact an offspring of theirs.

Recently, one observer, F. Peacock, reported a type of distraction behaviour which, if the interpretation is correct, is again remarkable. A small breeding group of Southern Pied Babblers, consisting of an adult pair and an individual in immature plumage, had young in the nest and, every time one of the adults found a food item large enough to be worth delivering to the young, it would hop up to a perch and give a few calls. These calls would cause the immature to fly at once almost to the observer's feet, where it would forage half-heartedly while keeping its eye on him. Meanwhile, the adult would fly to the nest, carrying the food item with it. This happened six times in a period of 40 minutes, and Peacock had "the distinct impression" that the immature was being sent on a mission to distract him, the human observer, from noticing what the adults were doing, in an attempt to keep the presence of the nest secret. As soon as the adult returned from the nest, the immature left him to join it.

None of this is proof against brood parasitism, and babblers are major targets of various species of cuckoo. As many as 24 timaliid species are known to be victimized by *Clamator* cuckoos, which are particularly frequent parasites of *Turdoides* nests. For example, 7.8% of Arrow-marked Babbler nests accommodate the eggs and young of Levaillant's Cuckoo (*Clamator levaillantii*). The Streaked Laughingthrush is apparently parasitized by three different cuculids of two genera, the Jacobin Cuckoo (*Clamator jacobinus*), the Large Hawk-cuckoo (*Cuculus sparveroides*) and the Indian Cuckoo (*Cuculus micropterus*). Parties of smaller babblers, at least, will mob cuckoos, distinguishing readily enough between drongos and drongo-cuckoos (*Surniculus*). The Wrenit's resistance to brood parasitism by Brown-headed Cowbirds, expressed in terms of refusal to leave the eggs unguarded, is so strong that researchers sometimes have physically to remove the sitters, and there is a high rate of rejection of cowbird eggs and young and abandonment of parasitized nests.

Nesting success is variable, but the data are too few to be meaningful. It has been recorded, for example, at 75% for the Giant Babax, 57% for the Common Babbler, 42% for the Taiwan Yuhina, 42% for the Yellow-billed Babbler, 40% for the Plain Laughingthrush and 40% for the Jungle Babbler. In one study of

Grey-checked Fulvettas, natural mortality was determined as 34% per year, attributable mainly to cold weather in January and February. In another study of this species, typhoons were identified as a second cause of mortality, accounting almost entirely for juveniles, although severe typhoons kill adults, too. Almost certainly, these values diminish among babblers in climatically more stable environments in South-east Asia.

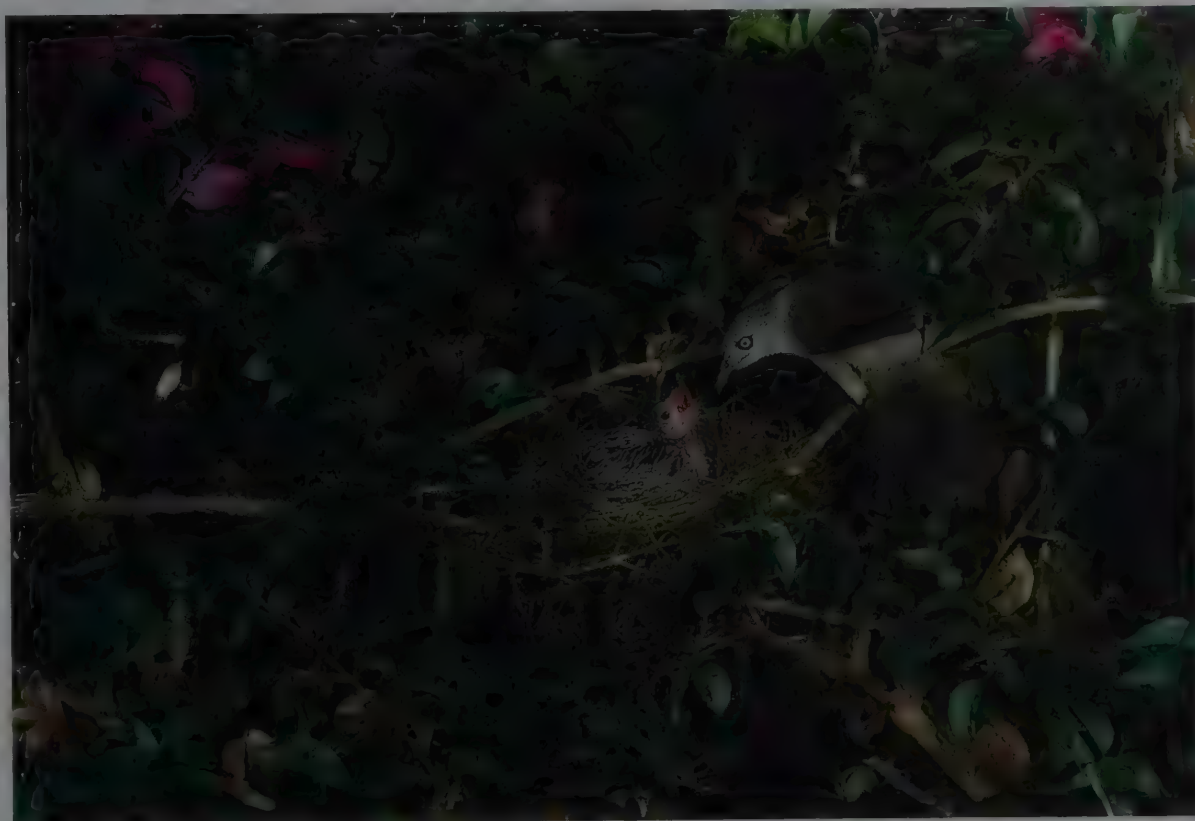
Meanwhile, the rest of life beckons for youngsters that have survived beyond fledging. For Wrenit's, with their limited flight capacity and dense low habitat, dispersal can be problematic, and the distance that the young birds travel from the natal nest-site to the site of their first breeding attempt is less than 400 m. Non-breeding individuals, or "floaters", occur in high numbers in years following those with high productivity, and also in years with high breeding densities, and adults appear to show some tolerance of wandering juveniles and family groups at the end of the breeding season and in winter. Among Indian *Turdoides* babblers, juveniles usually stay in their natal groups, but there has to be dispersal at some point, and five out of 104 fledgling Yellow-billed Babblers in one study joined neighbouring groups as early as 40 days after fledging, while others, mainly females, were evicted over time by pressures within the group.

The pattern of socialization in these Indian *Turdoides* is predictable. During the immediate post-fledging period, for about a month, the juveniles spend most of their time being fed by older birds and avoiding being preyed on. Then they begin to move with the group and forage in part for themselves, and they also start play activities and lose their position at the centre of the roost (see General Habits). The next few months are ones of "adolescence", during which they show signs of social indiscipline such as chasing food-carrying adults, pecking one another aggressively and disrupting the roost. This, in turn, declines over the winter months, and by the first summer their behaviour is similar to that of older group-members, although they rank low in terms of sentinel behaviour, allopreening and movement initiation.

This all sounds reasonably comfortable. As an insight into the cut-throat pressures of life in a babbler family, however, a story based on work being undertaken by A. Ridley on Southern Pied Babblers is sobering. In one post-breeding family group that

Brood parasitism by cuckoos is a significant feature of breeding in babblers. Twenty-four timaliid species are known to be parasitized by *Clamator* cuckoos, and this number will doubtless rise with further research. The risk seems to be highest in *Turdoides* babblers. In a study of the Arrow-marked Babbler (*T. jardineii*), for example, Levaillant's Cuckoo (*Clamator levaillantii*) was shown to parasitize 7.8% of the nests. A juvenile of this cuckoo is shown here in the nest of another *Turdoides*, the **Brown Babbler**. Smaller babblers are targeted by cuckoos such as *Cuculus* and *Surniculus*.

[*Turdoides plebejus platycirca*,  
Fajara, Gambia.  
Photo: Michael Gore]





Ridley followed, the runt, a tiny female from a brood of four, was continually being left behind. Its parents, the group's dominant pair, never attempted to help it, leaving it to the care of two subordinate birds. After a week, the runt was strong enough to keep up with the group as it moved between sites, but only as a result of the subordinate birds' attention. Then, before the first brood was a month out of the nest, the dominant pair started to breed again. This brought an upsurge of competition among the fledglings because, with one adult now incubating, only three adults were available to feed them. Only one of the second brood survived, and the parents put almost all of their effort into this new fledgling. As a result, the older fledglings began to lose weight, the playfighting stopped and a new begging intensity began, this abating only when the rains finally arrived and the food supply abruptly increased. The single surviving fledgling from the second brood quickly reached parity with his older siblings and began playfighting with them. Leaving provisioning to the subordinates, the two partners constituting the dominant pair fed themselves up in order to produce a third brood. The first brood was now old enough to help with the feeding of the new nestlings, but this triggered new strife among them, one individual wrestling food from another so as to be the one to feed it to the nestlings, and they established a hierarchy of their own. Eventually, one older sibling, through sheer persistent one-on-one aggression, forced its nearest rival to quit the group altogether. None of the adults interfered. Over the following few days the evicted sibling lost weight and condition, reverting to that of a month-old fledgling, but for two weeks he never stopped trying to rejoin the group. Eventually, the aggressive sibling desisted and the evicted bird rejoined the group, but he was now totally subordinate.

In the following year, one of the group's subordinate adults that had given most help to the first and second broods was evicted by the dominant male, since the benefit to the latter of evicting it was greater than the benefit of the quality of help that the evicted bird could then provide. The evicted babbler had helped to maximize the dominant male's genetic standing by contributing to the group's growth in size, but he had thereby also sealed his own fate, since the larger group was seen by the dominant male as sufficient to help with the season's new crop of offspring, meaning that his subordinate, always something of a threat to his status, could be safely thrown out. We can now see rather more clearly that it was hardly a happy family that he was leaving behind.

## Movements

Babblers, at least as the family is constituted in the present treatment, are highly sedentary birds. None of them undertakes a long-distance migration such as is typical of certain species of, for example, Old World warbler and chat. The great majority of timaliids, 75% of the species, are residents, while a further 10% have been either reported as making or inferred to undertake elevational displacements without proof ever having been furnished. This leaves 12% for which elevational movements are usual, if nearly always minor, and 3% which conduct other, minor types of geographical shift.

Into this last category go four African *Turdoides*, which respond to drought or rains with local short-distance migrations, regular or sometimes nomadic, and three other species. These are the Chestnut-faced Babbler of Luzon, in the Philippines, for its records from the migration bottleneck at Dalton Pass, where it presumably would not occur except as a bird on the move; the Chestnut-collared Yuhina for its curious irruptions every few years into Hong Kong, movements which presumably occur throughout its range but have not been recorded elsewhere; and the Blue-crowned Laughingthrush, which has an alarming habit, particularly as it is so highly threatened (see Status and Conservation), of disappearing from its single known surviving site for the period from August to March. The description of the White-hooded Babbler as a local migrant in Kaziranga National Park, in north-east India, is surprising and does not seem to refer to elevational displacements. Similarly, records of the Chinese Bush-dweller in the Korean Peninsula in winter cannot easily be attributed to downslope movements and perhaps involve a more general dispersal in the harsh sub-Siberian winter.

There is also an interesting observation made by the English admiral and naturalist H. Lynes, who noted on the labels of some April specimens of Chinese Hwameis, now in the American Museum of Natural History, that the birds had been singing in the tops of a clump of big willows in a plain "a mile from any other trees" and with "testes scarcely if at all enlarged", and were therefore "obviously on migration". Such a thing has not been recorded for the species otherwise, and it is equally plausible that the individuals in question were, in fact, recent escapees from local bird markets and had dispersed into the local environment.

Elevational movements in the Himalayas and associated ranges have been reported for a good number of species, but not always in a way that allays suspicions of seasonal variation in



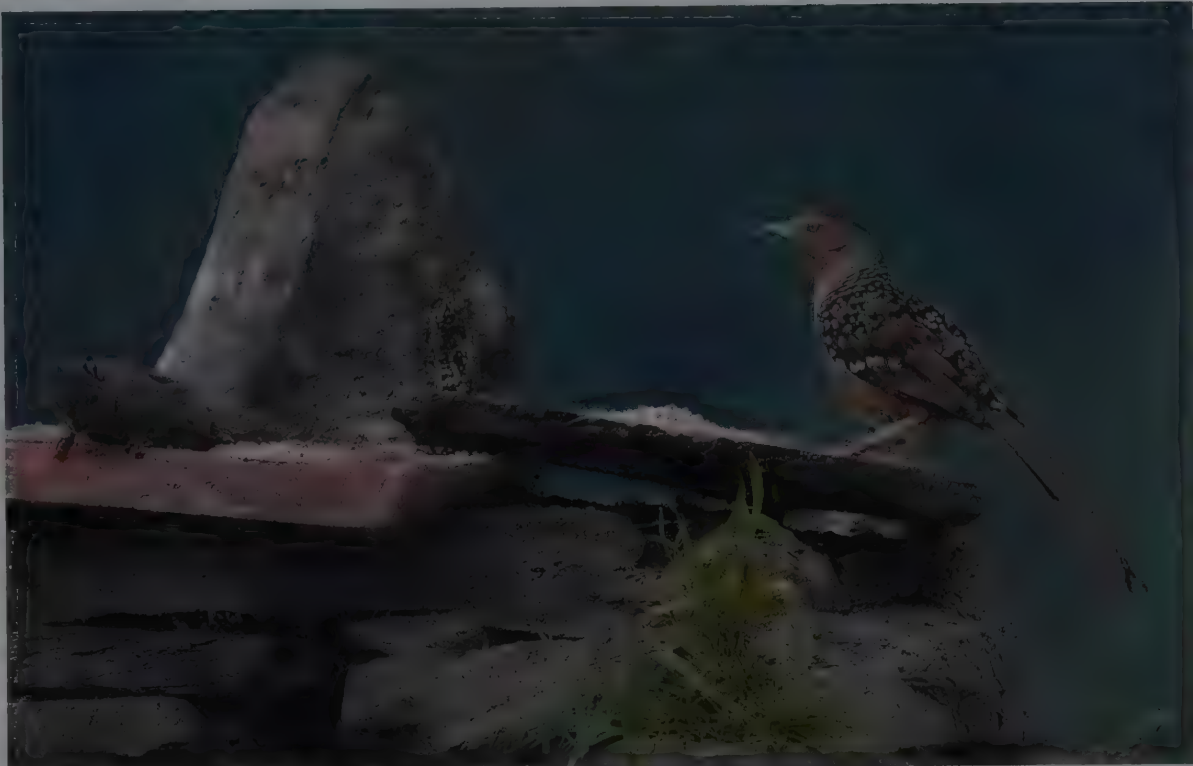
Nest hygiene is of paramount importance in babblers, as it is for all passerines. For species with dome-shaped nests, such as the **Pin-striped Tit-babbler**, the removal of faecal sacs is essential to minimize the build-up of excrement in the nest cavity, and the associated risk of disease. In species with open nests, the removal of faeces is probably as much to do with minimizing the accumulation of eye-catching droppings at the nest rim, something that may attract predators. In timaliids, both sexes take responsibility for removing faecal sacs, either eating them directly, or disposing them some distance from the nest-site.

[*Macronus gularis gularis*,  
Mandai, Singapore.  
Photo: Ong Kiem Sian]

Babblers are often victims of mankind's exploitation.

Many forest species are in retreat due to habitat destruction, while the most beautiful species, or the most powerful songsters, are often trapped and sold as cagebirds. Occasionally, however, babblers benefit from mankind's benevolence, with a few species taking scraps left out for them at human settlements. Here, a squirrel shares a Chinese bird table with a **Giant Laughingthrush**. This handsome species, one of the largest timaliids, occurs in forest and scrub in mountainous regions of south China and Tibet.

[*Ianthocincla maxima*,  
near Maerkang,  
Sichuan, China.  
Photo: John & Jemi  
Holmes]



detectability or field effort. Nevertheless, they are fairly well documented for the following species: the Golden-breasted and Ludlow's Fulvetas, the Stripe-throated, Rufous-vented (*Yuhina occipitalis*), White-naped (*Yuhina bakeri*) and Whiskered Yuhinas (*Yuhina flavicollis*), the Sickle-billed Scimitar-babbler, the Rufous-throated (*Spelaeornis caudatus*), Spotted, Scaly-breasted, Nepal and Pygmy Wren-babblers, the White-throated, Streaked, Spotted, Scaly, Blue-winged, Variegated, White-whiskered, Black-faced and Chestnut-crowned Laughingthrushes, the Bar-throated and Red-tailed Minlas, the Red-billed Leiothrix, the Rufous, Black-headed and Beautiful Sibilas (*Malacias pulchellus*), the Blue-winged Siva, the Hoary-throated and Streaked Barwings (*Actinodura souliei*), the White-browed and Black-eared Shrike-babblers and the Fire-tailed Myzornis. In Africa, vertical movements by the Bush Blackcap and the Drakensberg Rockjumper (*Chaetops aurantius*) have been documented, and there is some evidence that the Mountain Illadopsis, too, may make minor displacements.

Some of the Himalayan records derive entirely from Bhutan, as a result of detailed mapping work, although there are a number of other indications from long-term projects in various protected areas. The nature of the displacements, however, is by no means clear. In some cases, as typified by the Streaked Laughingthrush and Streaked Barwing, they occur only in hard winters or in response to particularly bad spells of weather. In the great majority of cases, the evidence is that the movements are minor, and sometimes it appears that they are made by only part of the populations, for example those at higher elevations or else, perhaps, younger birds within the population, and so on; again, this could be local in nature, rather than a constant pattern throughout the birds' ranges. There are two cases in which the species in question, the Stripe-throated Yuhina and the Fire-tailed Myzornis, having shifted downwards in winter, reportedly follow the flowering of trees in a steady springtime upward movement, and the Chestnut-crowned Laughingthrush is also described as moving back upslope progressively, albeit not in relation to flowering.

In general, the list is reasonably predictable. The presence of six *Trochalopteron* laughingthrushes is hardly surprising in view of the fact that species in this genus tend to occur at higher elevations than do many others in the family, and for the same reason one may have expected several other high-altitude members of *Fulvetta* besides Ludlow's to be listed. Four *Yuhina*, three

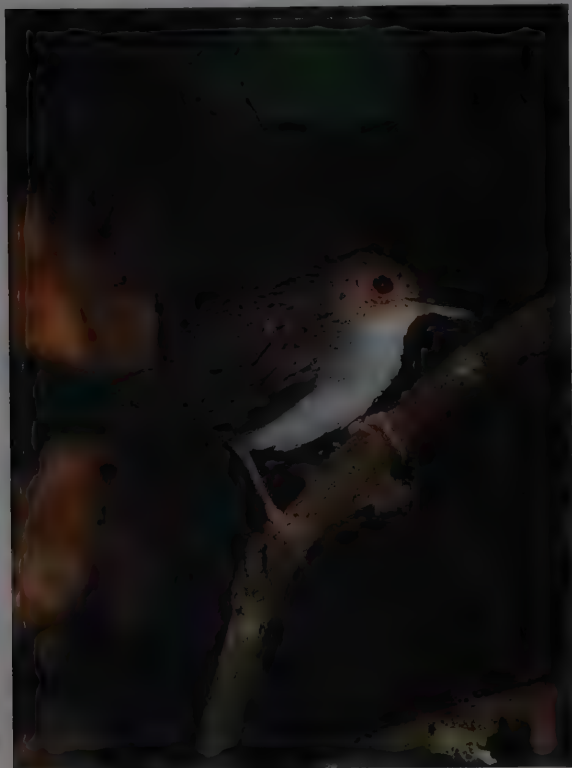
*Malacias*, *Pseudominla* and *Myzornis* are all predictable, given their partial dependence on flowers not for nectar alone but also for insects, and this may also explain the presence of two *Actinodura* species. Perhaps the oddest members of the list are the tiny tailless *Pnoepyga* wren-babblers, which nonetheless undertake what appear to be the most notable vertical migrations of all. The Nepal, Scaly-breasted and Pygmy Wren-babblers are subject to considerable movements, the Scaly-breasted being found in the Dehra Dun valley and Corbett National Park, in the north Indian state of Uttaranchal Pradesh, only in winter, and the Pygmy regarded as an uncommon winter migrant in both Nameri and Kaziranga National Parks, in Assam. Perhaps it is precisely

**The Rufous-fronted Laughingthrush** is a restricted-range species endemic to the Indonesian island of Java. It is locally common in broadleaved evergreen forest in the montane zone, often joining other passerines in mixed-species foraging parties. Like many Javan birds, it suffers from heavy trapping pressure for the cagebird trade, a threat that has apparently caused declines even within major protected areas, such as Gunung Gede-Pangrango National Park. It is fairly common, however, in less-accessible mountainous regions, where habitat remains relatively secure. Its conservation status is currently defined as **Near-threatened**.

[*Garrulax rufifrons*,  
rufifrons,  
Java.  
Photo: Roland Seitre]







because of the small size of these timaliids that they are driven by thermoregulatory necessity down the mountain slopes as winter temperatures drop. What is difficult to credit for so unaerodynamic a bird as a *Pnoepyga* is that these movements can proceed in any way other than a series of very short flights and a lot of hopping.

Apart from these, the two species showing the strongest seasonal altitudinal displacements are the Red-billed Leiothrix in Asia and the Bush Blackcap in southern Africa. The leiothrix appears to make a post-breeding descent throughout the Himalayas, in rather rapid shifts that take place in early November, and

moves back up again in late April. The post-breeding wanderings of this species in Hawaii, where it has been introduced, suggest that this vagility, which sometimes involves upward movements rather than downward ones, is an important part of the dispersal process. Ringing has shown that Bush Blackcap populations breeding in the high Drakensberg can shift downwards over a linear distance of as much as 300 km, records from outside the normal range suggesting that some individuals, perhaps mainly dispersing juveniles, overshoot. Even so, in neither case is it clear that the entire populations supplying the migrant birds shift their ground; on the contrary, it may be that some individuals remain at their high-lying breeding elevations throughout the year.

### Relationship with Man

Skulking, wary denizens of forest undergrowth or dense scrub, most babblers are far too removed from the human environment to figure in any significant way in human cultures or economics. Some are equally unobtrusive in their coloration, leaving even less opportunity to come to man's attention except through their songs, which, although often attractive, are generally not sufficiently special to draw great interest.

The great exception is the Chinese Hwamei, the song of which is among the best and most powerful to be heard in Asia. Because they are extremely territorial and pugnacious, the males are very easily caught. The trapper uses a divided cage with a captive male in the inner compartment; the cage is left in the brambles, with the outer trapdoor set, and, when the captive male sings, the free male immediately responds and approaches, entering the cage and being caught. The birds are commonly used simply as cagebirds, and apparently make excellent pets, but they were, at least formerly, pitted against each other in physical fights, as a form of "entertainment". Perhaps because of this, the species did not always have a favourable association, as La Touche reported:

"At Chinkiang, on the Lower Yangtse, the carrying of a Hwamei in a cage, with the large hanging hook pointing forward, indicated in the later days of the Manchu Dynasty that the owner was a local bully; and I have heard it

**The White-chested Babbler** occupies a classic Sundaic range, extending from south Myanmar to the islands of Sumatra and Borneo. Throughout this range it is a specialist of forested riverbanks, and is often seen hunting for insects on exposed roots and rocks at the water's edge, or darting out to catch insects flying over its surface. This narrow niche presumably results in a relatively low overall population size, especially given the rapid rate of deforestation. However, the species tolerates degraded habitats and overgrown plantations, and is therefore not immediately threatened. It remains fairly common and is classified as Near-threatened.

[*Trichastoma rostratum rostratum*,  
Panti Forest Reserve,  
Malaysia.  
Photo: Ong Kiem Sian]



**The Grey-breasted Babbler**, a Near-threatened swamp-forest specialist, is generally scarce in lowland forests of Peninsular Malaysia, Borneo and Sumatra. It is threatened by the widespread destruction of swamp forest, but survives in degraded habitats. It relies on the long-term protection of peat-swamp reserves, including Tanjung Puting and Gunung Palung National Parks, Borneo. Usually included in *Malacopteron*, its unique head pattern, morphology and behaviour suggest that it warrants isolation in a monospecific genus.

[*Ophrydomis albobularis moultoni*,  
Bentuang-Karimam  
National Park,  
West Kalimantan, Borneo.  
Photo: Doug Wechsler/  
VIREO]

The **Giant Babax** is a Near-threatened, restricted-range species confined to south-east Tibet (part of the Southern Tibet Endemic Bird Area). Its global population, currently estimated at 120,000 birds, is thought to be declining because of the loss of key breeding habitat: high-altitude woodland and scrub. This is being converted to grazing lands and removed for firewood.

The species reaches a maximum length of 33.5 cm, a maximum weight of 160 g, and a maximum altitude of 4600 m. In the entire timaliid radiation, only one species is larger, and no other species occurs higher above sea-level.

[*Babax waddelli waddelli*, Tibet.

Photo: Walter Mankel]



said that people 'not in the swim', daring to carry their birds in this way, were likely to be attacked and have their birds taken away from them. For this reason, in those days, as recently as 1905, it was not a bird for respectable Chinkiang people to carry about."

Today, however, it appears that the "fighting" is for the most part in the form of song-fighting, with keen competitions held to discover which bird is the best singer. Many individuals of this species captured in China are traded via Hong Kong to Singapore, where competitions certainly were, until recently, particularly intense; moreover, such was the extent of the interest that, grasshoppers being a song stimulant, professional grasshopper-collectors on the island would travel to adjacent Johore to bring back supplies for the fanciers. The hwamei clearly is, however, a fighter of sorts, because despite the enormous trapping pressure, not only in China but also in Vietnam, the species remains tolerably common and recovers quickly once trapping pressure is removed.

The glorious colours of the laughingthrushes have been a considerable attraction to bird-fanciers down the years, and the fact that many species come from remote parts of Asia serves only to make them more attractive. In Germany, where there is a long tradition in the keeping of exotic cagebirds, many species of the old extended genus *Garrulax* (see Systematics), and, indeed, other babblers about which we know little in life, have been kept and their breeding and behaviour documented, although one of the best studies of a captive population of the super-popular Red-billed Leiothrix was made by a Canadian aviculturalist, Gibson.

These same species are considerable drivers of ecotourism in parts of Asia. Some of the large laughingthrushes, such as the Giant and Spotted Laughingthrushes, are so extraordinarily patterned that they are top targets for birdwatchers; and no birder going to Emei Shan, in south China, would want to miss out on the spectacular Grey-cheeked Liocichla or the Gold-fronted Fulvetta. Everyone visiting the Himalayas wants to see a Fire-tailed Myzornis, whether it is a true babbler or not (see Systematics), and one of the best opportunities may be while searching for another spectacular liocichla, the newly described Bugun Liocichla, known only from the Eaglenest Wildlife Sanctuary, in Arunachal Pradesh, a species clearly destined to become a "must-see" for many future bird tours to north-east India. Any bird-

watcher visiting Myanmar and suffering at the end of a hot day in the field could always infuse the black hair-like stalks of a fungus with which the Dark-backed Sibia lines its nest; the local people do so as a cure for headaches.

The genus *Turdoides* has proved to be a highly rewarding set of species in terms of behavioural ecology. The problems posed by group-living, relating to social status, helping at nests and altruistic behaviour, were opened up by the pioneering work of Gaston on Jungle Babblers in India, with answers steadily accumulating and resolving in the remarkable long-term study of Ara-



The **Orange-billed Babbler** occurs from sea-level to 2100 m in Sri Lanka. It inhabits a range of well-vegetated habitats, including broadleaved evergreen forest, thickets, bamboo, secondary forest, and tea plantations.

A restricted-range species confined to the Sri Lanka Endemic Bird Area, it is generally common in the lowlands, especially in the Sinharaja National Heritage Wilderness Area. It is currently listed as Near-threatened in view of the many pressures facing Sri Lanka's forests, including intensive logging and clearance for agriculture and settlements.

[*Turdoides rufescens*, Martin's River Lounge, Kitulgala, Sri Lanka.

Photo: Andy & Gill Swash]

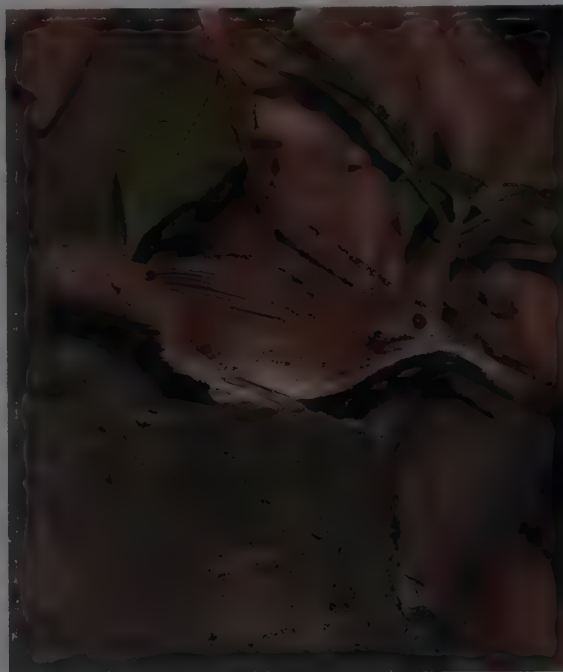


bian Babblers led by Zahavi in Israel, and, in very recent years, studies by A. Radford and Ridley of Southern Pied Babblers in Namibia. Zahavi has elegantly used the example of Arabian Babblers to develop and reinforce his idea of altruism as a "handicap". Status within social groups is crucially important, and Zahavi's theory is that an individual can achieve high rank not only by the sheer strength that makes it the most dominant individual, but also by acts of apparent generosity which signal to others its superior quality, since it is able to survive and continue as a group-member in spite of the disadvantage, the self-imposed handicap, incurred by its seemingly selfless behaviour.

Not only is the White-browed Laughingthrush reputedly a pest in orchards and crops but, improbable as it seems, the Taiwan *Liocichla* has been claimed to be a pest in cultivated pearl-millet, potato, peach and orange crops. These are extremely unusual considerations, however, and it seems very unlikely that either species can do any serious economic damage. Within their habitats, on the other hand, babblers are generally relatively common and therefore fairly important avifaunal components, contributing strongly to the insectivorous guilds of scrub, second growth and the lower storeys of forest, and consequently to the overall health of these habitats and the ecosystems of which they form part.

The origins of some scientific names can prove somewhat surprising. *Leonardina* was established by E. A. Mearns in 1906, after a failed attempt in the preceding year with *Leonardia*, which was preoccupied. The name was in honour of Leonard Wood, a long-standing military colleague and friend of the "super-macho" Theodore Roosevelt. The two men fought together in Cuba, where Wood was governor during 1899–1902, they hiked, rode and wrestled together, and even in the latter's White House years they played "singletick", in which they put on padded helmets, breastplates and gauntlets and then "beat one another like carpets". In 1905–1906, Wood was in charge of military forces on Mindanao, in the Philippines, and gave his support to biological fieldwork undertaken by the Smithsonian Institution, but in March 1906 his troops notoriously killed 600 Moslem Moros, including women and children, holed up in a volcanic crater on the island of Jolo. Mark Twain called it Christian butchery, Roosevelt a "brilliant feat of arms". Mearns's own tribute, albeit the year before this event, was in the name of the humble and retiring Bagobo Babbler (*Leonardina woodi*), one of only two avian species in which the first and last names of a person are used for, respectively, the generic and specific names, the other being the Zapata Wren (*Ferminia cerverei*), named for its discoverer, Fermin Cervera. Wood sought the Republican presidential nomination in 1920, and in the following year became a most unpopular Governor General of the Philippines, a position that he held until his death, in 1927.

Indeed, another genus name based on a figure of some historical notoriety has sometimes been applied to some other Phil-



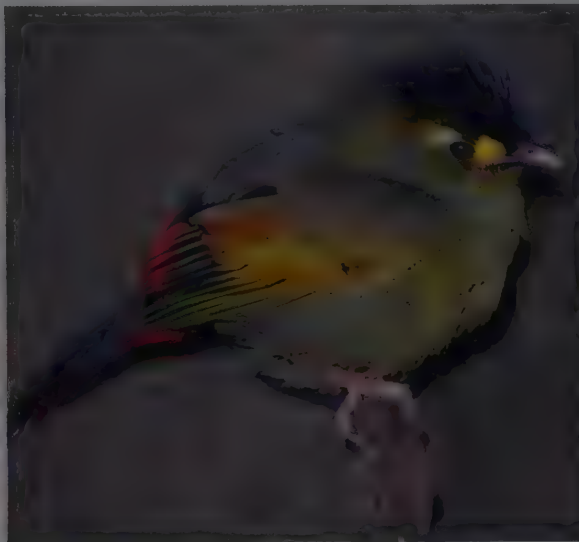
ippine babblers, although this one, *Borisia*, cannot be used for these birds, as the same name was earlier applied to an insect genus. In any case, the oldest name for this group of babblers as currently constituted is *Sterrhoptilus*. Nonetheless, the case is not without interest, the name *Borisia* having been erected by the Marquess Hachisuka for and "by the gracious permission of His Majesty Boris III, King of the Bulgarians". Boris ruled from 1918 to 1943, when he died prematurely amid rumours of dirty tricks. He had made himself dictator in 1934, a year before Hachisuka's honour, but only reluctantly aligned himself with the axis powers in the Second World War. He had been resisting Hitler's demands to attack Russia when he died, and he had refused to deport the country's 50,000 Jews to Poland, but he did sanction the removal of 13,000 Jews from lands reoccupied by Bulgaria, thus managing at once to be revered and reviled for his actions.

### Status and Conservation

Babblers are not, so far as the great majority is concerned, at serious risk. No species is known certainly to have become extinct, and, remarkably for a family comprising 309 species, only

The **Indochinese Wren-babbler**, previously known as the "Short-tailed Scimitar-babbler" and isolated in the monotypic genus *Jabouilleia*, was formerly considered **Vulnerable**, but was downlisted to **Near-threatened** after healthy populations were found in several protected areas in Laos and Vietnam. It is currently classed as a **restricted-range species**, present in two **Endemic Bird Areas** (Annamese Lowlands and Da Lat Plateau), but its range size needs re-evaluation after the recent discovery of populations in Myanmar.

[*Rimator danjoui parvirostris*, Bach Ma National Park, Central Annam, Vietnam. Photo: James Eaton/Birdtour Asia]



Two *Liocichla* species are listed as **Vulnerable**. The **Grey-cheeked Liocichla** occupies a restricted range in Sichuan and Yunnan, China, while the recently described **Bugun Liocichla** is only known from Arunachal Pradesh, India. Forest species, both are threatened by habitat destruction.

[Left: *Liocichla omeiensis*, China. Photo: Roland Seitre.

Right: *Liocichla bugunorum*, Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India. Photo: Ramana Athreya]

The **Bornean Ground-babbler** inhabits lowland evergreen forest on Borneo. It is listed as Vulnerable, and is perhaps especially threatened by habitat fragmentation because it is an understorey bird, and therefore less likely to disperse through unsuitable habitat. Action is required to control intensive logging, and to halt the rapid clearance of forest to supply paper mills and to make way for oil palm plantations.

[*Ptilocichla leucogrammica*, Bentuang-Karimum National Park, West Kalimantan, Borneo. Photo: Doug Wechsler/VIREO]



one, the recently "split" Blue-crowned Laughingthrush, is classed as Critically Endangered under the IUCN threat-status categorization. Just six more are listed as Endangered: the Flame-templed Babbler; the Negros Striped Babbler (*Zosterornis nigrorum*); the Black-chinned Laughingthrush; the Collared Laughingthrush (*Trochalopteron yersini*); the White-throated Mountain-babbler; and the Grey-crowned Crocias (*Crocias langbianis*). In fact, the conservation status of the Black-chinned Laughingthrush requires reassessment, as the subspecies *jerdoni* has very recently been removed from the Kerala Laughingthrush and placed with the Black-chinned, which was previously monotypic. A further 21 timaliids are placed in the Vulnerable category, with 37 species Near-threatened, and one (herein treated as two species) Data-deficient.

Nevertheless, a few cautionary comments on these figures are needed. Foremost is the consideration that the taxonomy adopted in the present treatment is very new, and BirdLife International, which makes the global assessments, inevitably requires time both to consider the legitimacy of the arrangement and, if accepting it, to undertake the necessary reviews of conservation status. Indeed, following very recent taxonomic "splitting", two of the newly recognized species were added to the threatened list in early 2007. These are the Black-and-white Laughingthrush of

Sumatra, rated as Vulnerable, and the aforementioned Critically Endangered Blue-crowned Laughingthrush of China. A third species, the Bugun Liocichla, was described as new to science as recently as August 2006 and it, too, has now been classed as Vulnerable.

The Blue-crowned Laughingthrush is a great puzzle. It is known from two very restricted sites 1800 km apart in China, at one of which, Simao, in Yunnan, it has not recently been found and at the other of which, Wuyuan, in Jiangxi, it numbers fewer than 200 individuals; yet it has appeared in international trade in the past 20 years, suggesting the possible existence of an undiscovered population. The captive birds are now being carefully managed by a small, dedicated group of zoos and collection-owners. The Black-and-white Laughingthrush, as so many songbirds in Indonesia, suffers from intensive trapping, to the extent that it is an extremely difficult bird to find on the island; indeed, its close relative the White-crested Laughingthrush is now widely imported into Sumatra, presumably as a substitute for the virtually vanished native. Meanwhile, the Bugun Liocichla remains known from just one small area adjacent to Eaglenest Wildlife Sanctuary, in the north-east Indian state of Arunachal Pradesh. The total number of individuals observed here to date is no more than 14, resulting in the decision of the discoverer, R. Athreya, to name the species on the basis of some feathers from and photographs of an individual that was then released. A plan to build a major highway through the single site where the liocichla is known to occur has given rise to considerable alarm among conservationists.

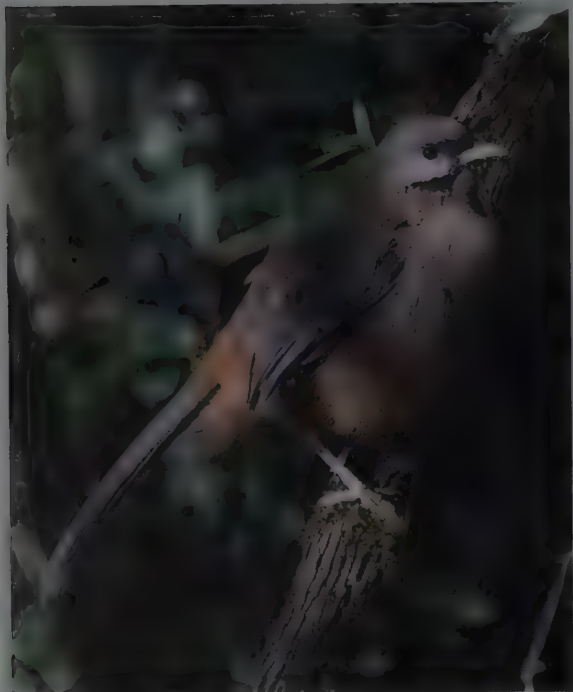
Apart from these, it may be expected that the threat level of several other species will be upgraded. Four timaliids on the current BirdLife list have each now been split into two species, and it seems very likely that the smaller ranges of each, coupled with new information about threats to the habitat, will result in new categorizations. The species involved are the two *Robsonius* babblers, formerly treated as conspecific under the name of "Luzon Wren-babbler"; the two *Sphenocichla* wedge-billed babblers, previously lumped as one; the Mindanao Pygmy Babbler (*Sterrhoptilus plateni*) and Visayan Pygmy Babbler (*Sterrhoptilus pygmaeus*), until recently considered conspecific; and the two *Micromacronus* babblers, formerly combined under the name of "Miniature Tit-babbler". When each of these pairs is treated as a single species, the first three are listed as Near-threatened and the fourth as Data-deficient. Other species as yet not recognized by BirdLife, but which would be likely to be accorded a threatened category, are the Cambodian Laughingthrush, owing to its scarcity within a very limited range; the Orange-breasted Laughingthrush (*Stactocichla annamensis*), Vietnamese Cutia and Black-crowned Fulvetta, for the same reasons; the Taiwan Hwamei, because of its potential interbreeding with escaped Chinese Hwameis; the White-throated (*Rimotor pasquieri*) and Sumatran Wren-babblers (*Rimotor albostratus*), because of their

The **Black-crowned Barwing** was described in 1999 from Ngoc Linh, central Vietnam. Soon afterwards it was found in the highlands of adjacent south Laos. It seems to be restricted to these two areas, where it is scarce and local. Habitat loss and degradation may be causing a decline, and the species is listed as Vulnerable. It will benefit from a conservation project targeting Ngoc Linh Nature Reserve.

[*Actinodura sodangorum*, LoXo Pass, Annam, Vietnam. Photo: James Eaton/Birdtour Asia]







seeming great rarity within poorly understood ranges; and the Naga Wren-babbler, for its tiny range.

The listing of only a proportion of these species as globally threatened would bring the babblers a little more into line with general trends among bird families. At present, Timaliidae has disproportionately few higher-category listings and disproportionately many Near-threatened species, and it will be interesting, therefore, to follow developments in the process of reassessment. One notable and already mentioned feature of the family, its extreme weakness as a cross-water colonist, does, however, mean that it possesses relatively few insular populations, or, at least, relatively few populations on islands small and isolated enough to experience traumas that cause species to decline sharply or to die out. This probably best explains the paucity of Critically Endangered and Endangered species in the current BirdLife assessment.

Even so, there is one species that presents a difficult problem of conservation-status classification, and which is quite possibly extinct and thought by some to be so. The Black-browed Babbler (*Malacocincla perspicillata*) is known from a single specimen collected by C. A. L. M. Schwaner between 1843 and 1848 and sent to the National Museum in Leiden, Holland, where C. L. Bonaparte, the exiled nephew of emperor Napoleon, described it and indicated its provenance as Java. Much later, the Swiss curator of birds at Leiden, J. Büttikofer, realized that the museum had sent Schwaner not to Java, but to southern Borneo, and it was established that he spent much of his time there in the Martapura area of the far south-east. It is, therefore, there that the Black-browed Babbler, which has never been seen again by any eyes that would have known it as such, is believed to have been found. Leiden Museum's website, where the type specimen can be viewed from all angles, states that the species is extinct, owing to its absence from the ornithological record over a period of 160 years and to the horrific deforestation to which all of Kalimantan, especially the lower-lying areas such as in the south-east, has been subjected. On the other hand, BirdLife International, with somewhat misplaced optimism, has treated it as Vulnerable, when in truth the species should be treated as Data-deficient. Searches in Pleihari Martapura are called for.

All six of the Endangered timaliids possess very small ranges, all are birds of forest, and all of their forests, five in Asia and one in Africa, are under pressure. This is more or less the case also for the great majority of the 21 Vulnerable species, 19 of which are in Asia and two in Africa: in all cases, their ranges are slightly larger, though still small, but several of them, the Marsh Babbler,

Jerdon's Babbler and the Slender-billed Babbler, are grassland-dwellers, albeit with the same generic problem of habitat loss. The 37 Near-threatened species, 33 Asian and four African, are barely more diverse, the majority being birds of fairly restricted range and facing a degree of habitat loss, but the number is augmented by the inclusion of a suite of mainly lowland Sundaic forest species for which the 20-year rainforest holocaust in Sumatra and Borneo has been a serious cause of concern, despite their relatively wide ranges. These species include those which, in a review of the effects of fragmentation and logging of forests, were determined as responding unfavourably. Examples are forest-interior terrestrial insectivores such as the Large Wren-babbler and Striped Wren-babbler, and understorey foliage-gleaners such as the Black-throated Babbler, Chestnut-rumped Babbler and Fluffy-backed Tit-babbler.

Trade in wild birds affects many species of babbler, but only five, the Chinese and Taiwan Hwameis (listed as one species), the Silver-eared Mesia, the Red-billed Leiothrix and the Grey-cheeked Liocichla, are listed by CITES, in all cases on Appendix II. The last of these is listed principally in a precautionary role, which is technically not one that CITES is supposed to play and which involves the listing of species which would rapidly become threatened if international trade commenced; nevertheless, it is quite heavily trapped within China, a phenomenon over which, of course, CITES has no control. The Taiwan Hwamei is not heavily traded, but it is listed here because of its former conspecificity with the Chinese Hwamei, which is regarded as one of the finest singers in Asia and is exploited on a massive scale (see Relationship with Man).

The Silver-eared Mesia and the Red-billed Leiothrix are two of the most engaging and attractive of cagebirds, and both have been exploited on a huge scale. Evidence of this comes in CITES official figures, which show that the leiothrix is one of only two passerines, the other being the Hill Myna (*Gracula religiosa*), in the top ten species most commonly present in international trade at the present time. Evidence comes also, however, in the number of feral populations that have become established as a result of breeding and colonization by escapees, including in France, Spain, Germany, the Hawaiian Islands, Japan and the Mascarene Islands. Perhaps the most striking result of trade in babblers is the way in which the avifauna of Hong Kong has



**The Snowy-cheeked Laughingthrush** is a restricted-range species endemic to Sichuan and Gansu provinces, China, and present in the Central Sichuan Mountains Endemic Bird Area.

It occurs in a range of thickets, scrub and stunted forests at high altitudes, between 2000 and 3500 m, and is threatened by the loss and degradation of suitable habitat. It is known from eleven localities, at some of which it is fairly common. However, many areas within its range are inaccessible and poorly surveyed, and it may prove to be more widespread. It is listed as Vulnerable.

[*Ianthocincla sukatschewi*, Wanglang Nature Reserve, Sichuan, China. Photo: John & Jemi Holmes]

**The White-throated Mountain Babbler** occurs in humid montane forests of south-east Nigeria and neighbouring Cameroon. Its overall range is highly restricted, and is estimated at 1990 km<sup>2</sup>. The extent of its preferred habitat continues to shrink, and it is being eroded chiefly by intensive grazing, fire, clearance for agriculture, and exploitation for timber and firewood. The species is classified as Endangered and requires better protection of forests at key sites, including Mount Manenguba, Bakossi Mountains, Rumpi Hills, and Mount Kupé.

[*Kupeornis gilberti*, Bokossi Mountains, Cameroon. Photo: Ketil Knudsen]

**The Grey-crowned Crocias** is a restricted-range species endemic to Vietnam, where it is found only in the humid montane forests of the Da Lat plateau. It disappeared for many years after its discovery but has recently been found at several localities, at one of which it is not uncommon. Its habitat is threatened by forest degradation and fragmentation through logging, shifting agriculture, fuelwood collection and charcoal production, activities which are exacerbated by recent influxes of settlers from other regions. The species is currently classified as *Endangered*.

[*Crocias langbianis*,  
Tha Nung Valley,  
near Da Lat, Vietnam.  
Photo: Tibor Juhasz]

been augmented, no fewer than nine species having colonized the territory as a result of accidental escapes of birds in trade. These nine additions are the Streak-breasted Scimitar-babbler, Rufous-capped Babbler, Chinese Babax, Greater Necklaced Laughingthrush, Black-throated Laughingthrush, White-browed Laughingthrush, Blue-winged Siva, Silver-eared Mesia and Red-billed Leiothrix.

The ability of birds to withstand local exploitation for trade is not documented, but it is very crudely the case that babblers are among the commoner elements of avifaunas, sometimes very much the dominant species in numerical terms. Attractive sociable species such as the Black-and-white Laughingthrush are probably the most vulnerable: because they live in groups, all members of which can be caught with great ease by a skilled trapper using a decoy, they can very easily be removed completely from an area by this activity. Moreover, the use by many species of secondary habitats, indeed, their preference for such habitats, means that they are likely to persist even in areas where trapping pressure is considerable. Against this, however, it has to be said that, for many species, detailed data on distribution, density or ecology are lacking, and there is a real challenge to ornithologists to get into the field and provide such data so that the conservation needs of the species in question can be better understood. For example, how many birders, let alone field biologists, have ever seen *Micromacronus*, the single most astonishing discovery among the babblers in the past fifty years and, indeed, of the entire twentieth century? Fewer than five, for sure, in all that time. It is a bird of extraordinary interest, yet we know little more about it than the handful of places where it has been collected.

A fine example of a positive response to a such a need can be found in the research done in the past decade or so on Hinde's Pied Babbler. This species entered the IUCN Red List in 1985, and for a time languished without study. In the mid-1990s, however, work led by P. Njoroge and P. Shaw began to assess its true range, habitat use, breeding success and threats, with the result that its population size can now be stated with moderate confidence and its key habitat requirement is known. Thus, its global population is 1500–5600 individuals, and for high reproductive output it requires more than 10% thicket cover. With these pieces of evidence in place, this rare species is now among

**The Flame-templed Babbler**, a restricted-range species present in the Negros and Panay Endemic Bird Area, is known from five localities on Panay and 18 on Negros, but from only ten sites in total since 1980. It was once thought to be common and widespread, but it seems to be disappearing from many low-lying areas because of habitat destruction and fragmentation. It is listed as *Endangered*. It occupies a monospecific genus on account of its bizarre plumage pattern: a bristly yellow forehead, orange crown plumes, and white ear-covert shafts.

[*Dasycrotapha speciosa*,  
Mount Kanlaon,  
Negros, Philippines.  
Photo: Robert Hutchinson/  
Birdtour Asia]



the better-known timaliids, and its conservation can be pursued with vigour.

Nonetheless, global warming, which seems poised to wreak huge damage on most, if not all, bird populations around the world in the coming hundred years, will cast a long shadow of doubt over the future of many species of babbler. In southern California in 2002, the breeding success of the Wrentit, the sole New World member of the family, in semi-arid coastal sage scrub fell to just 3% of its 2001 level, from 2.37 fledglings per pair and 88.4% of adults attempting to breed to just 0.07 fledglings per pair and a mere 6.7% of adults making breeding attempts. The cause was drought, an abnormal circumstance perhaps, but, with an anticipated steady increase in aridity in the region owing to global warming, it may take only one or two more such droughts to eradicate the species altogether from this region.

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*ssp stierlingi*

*ssp abyssinica*

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*ssp chrysotis*

*ssp rahsoni*

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*ssp amoenus*

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*ssp valentinae*

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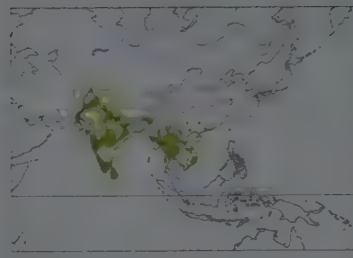
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lower flanks, thighs and vent; iris brown to pale crimson; bill brown, paler base; legs light grey-brown to dark brown. Sexes similar. Juvenile is brown above, with rufous uppertail-coverts and tail. Supercilium ill-defined. Voice: Song, given with throat puffed out, a clear, quickly delivered "phu pwit" (sounding like a human exhaling and then inhaling), sometimes introduced by short "chit" or similar, particularly when excited. When agitated, various combinations of short stuttering notes, e.g. "tu-chit-tu", "tu-chit-tu-chu", "ti-tu" and "tu-chip-tu", may be given before song.

**Habitat.** Grass, thickets near streams, scrubby hillsides, at 1500–3300 m, occasionally to 3700 m.

**Food and Feeding.** Invertebrates. Rather sluggish when foraging, usually in very dense undergrowth 2–3 m above ground. Will sit up in the open.

**Breeding.** Jun–Jul. Nest described as a cup made of leaves, twigs and bark, lined with wool and grass, placed 0.3 m above ground in small tree. Clutch 3 eggs, white with uneven reddish-brown, purple-brown and light brown dots, denser around broader end. No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common to common. A relatively poorly known species.

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## Genus CHAMAEA Gambel, 1847

### 6. Wrentit

#### *Chamaea fasciata*

French: Cama brune

German: Chaparraltimalie

Spanish: Camea

**Taxonomy.** *Parus fasciatus* Gambel, 1845, Monterey, Monterey County, California, USA. Additional proposed races include *intermedia* (from interior and S areas of San Francisco Bay region of California), synonymized with *rufula*, and *canicauda* (from NW Baja California), treated as a synonym of *henshawii*. Five subspecies recognized.

**Subspecies and Distribution.**

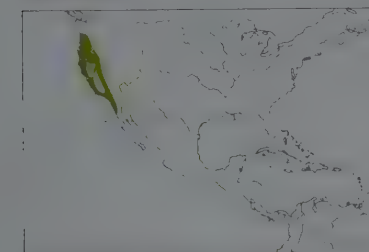
*C. f. phaea* Osgood, 1899 – extreme W USA from W Oregon (R Columbia) S along humid coastal belt to California border.

*C. f. margra* Browning, 1992 – interior S Oregon.

*C. f. rufula* Ridgway, 1903 – NW California coast from Oregon border S to San Francisco Bay area.

*C. f. fasciata* (Gambel, 1845) – coastal C California (from W Monterey County S to C San Luis Obispo County).

*C. f. henshawii* Ridgway, 1882 – interior and coastal S California, and extreme NW Mexico (NW Baja California).



**Descriptive notes.** 14–16 cm; 14–15 g. Small greyish-brown babbler with vague pinkish tinge below, long and rounded tail. Nominate race has crown greyish mid-brown with vague darker streaks, shading slightly paler (less grey) and plainer on nape and upperparts, including upperwing and tail; lores pale buffy grey, rest of face plain grey-brown; chin and submoustachial area pale buffy grey with darker flecks, shading below to dull greyish salmon-pink with vague darker streaking, apart from greyer neck side and slightly brown-tinged flanks and lower belly, thighs and vent; iris whitish; bill horn to blackish-brown; legs blackish. Sexes

similar. Juvenile is like adult. Races differ mainly in depth of plumage coloration: *phaea* is darkest, with brownest underparts; *rufula* is paler than previous, clearer rich brown above, paler vinaceous cinnamon below, flanks washed rufous-brown; *margra* is dark brown, flanks tinged pale pinkish-brown; *henshawii* is palest and greyest, greyish-brown above, greyish-buff below. Voice. Song of male, usually from cover but sometimes from exposed perch, a series of loud, rather dry notes on one pitch and speeding into trill at end, c. 3–4 seconds in duration, "yip-yip-yip-yip-yip-yip-yip-yip-tr-tr-tr-tr-tr-r-r-r-r-r" ("bouncing-ball song"), given throughout year but with greater frequency Mar–Jul, never very intensively, so that possibly as few as four bouts of song per hour (each bout with 3–6 songs), even at dawn in spring. Female sings a series of similar notes at constant rate of 2–3 per second, and with no trill; also throughout year, mostly from within cover. Sexes often answer one another when separated. Both sexes also give slower series of notes which are doubled, "weeka, weeka, weeka". Other calls are a scolding, rasping purr, often in groups of 3–5, for contact, a louder rasping and much-repeated "krrrr" in alarm, a soft mewling "mye-ah" when approaching young, a soft "peep" and low "chuck" when in group moving through vegetation. Bill-snapping heard in interspecific combat, and wing-whirring in distraction display near nest.

**Habitat.** Dense brushy and shrubby areas as are found in many habitats, including douglas fir (*Pseudotsuga*) and redwood (*Sequoia sempervirens*) forest, early successional growth, mature riparian valleys oak (*Quercus lobata*), oak woodland, mixed hardwood, conifer and conifer stands (reaching peak abundance in older forests), riparian deciduous scrub (e.g. willows (*Salix*), dense thickets of coyote bush (*Baccharis*) and blackberry (*Rubus*), and suburban areas, may occur in more open woodland with few shrubs. Highest densities in coastal sage scrub, northern coastal scrub and montane chaparral. In coastal Oregon, prefers dense huckleberry (*Vaccinium*) and salal (*Gaultheria shallon*); in Central Valley of California ideal habitat blackberry tangles and California grape (*Vitis californica*); in foothills and desert regions uses chamise (*Adenostoma fasciculatum*), California lilac (*Ceanothus*), manzanita (*Arctostaphylos*), scrubby oaks and even mesquite (*Prosopis*). Sea-level to 2300 m.

**Food and Feeding.** Insects, including caterpillars, butterflies and moths and their cocoons (Lepidoptera), beetles (Coleoptera), bees (Hymenoptera), ants (Formicidae), small wasps (Hymenoptera), scale insects (Coccoidea); also spiders (Araneae) and centipedes (Chilopoda), latter sometimes subdued by use of both feet. Also fruits and seeds, including those of elderberry (*Sambucus*), snowberry (*Symphoricarpos albus*), coffeeberry (*Rhamnus californica*), twinberry (*Lonicera imrayana*), blackberry, and laurel samac (*Rhus laurifolia*), seeds of poison oak (*Toxicodendron diversilobum*) especially important, offering seven-month winter food supply. Will eat various scraps at bird-feeders. Invertebrate food 52% and vegetable food 48% over whole year, but annual matter

up to 96% in spring, 36% in autumn. Nestlings in coastal California provided mainly with green larvae of geometrid moths ("inchworms"). Forages mainly by gleaning items from woody parts of plants, less commonly from leaves, petioles and fruiting stems. Will briefly hover, e.g. at sticky monkey flowers (*Mimulus*), and flycatch. Commonly forages in pairs or family parties, individuals close together. Will drink from standing water, but more commonly from wet surfaces of plants, but little dependence on water.

**Breeding.** Season Mar–Aug, start of breeding apparently timed in response to climatic conditions and to cues predicting conditions later in season: sometimes double-brooded (20% of pairs) if first brood raised relatively early in season. Monogamous, more than 95% of individuals mating for life; usually remains on territory if partner dies. Solitary, but record of two active nests only 4 m apart. Nest built by both sexes, in c. 6–7 days (range 3–14 days), a deep compact cup made of fibres, bark and spider web, lined with fine stems, outer wall sometimes plastered with lichen, placed usually 0.3–1.5 m above ground among twigs of shrubs; in coastal scrub in California mean nest height 0.75 m, mean height of vegetation 1.5 m, in riparian habitat mean nest height 1.7 m, mean height of vegetation 3.6 m; territory 0.24–2.15 ha (average 0.62 ha), generally smaller in denser than in sparser scrub. Clutch 3 or 4 eggs, rarely 2 or 5, pale greenish-blue; incubation by both sexes, period 14–15.5 days; nestling period 11–19 days (average 15 days); young stay in family party for 18–41 days (typically, 30 days) after fledging; as early as 30 days of age may form lasting pair-bond with older individual, staying on territory until next breeding season 11 months later. Nests parasitized rarely by Brown-headed Cowbird (*Molothrus ater*). Mean annual probability of nest fledging at least one young 45% at one site; eggs and nestlings preyed on by Western Scrub-jay (*Aphelocoma californica*), garter snake (*Thamnophis*) and gopher snake (*Pituophis*), and pair builds up to five nests in season in effort to rear single brood; c. 16% of pairs successful at fledging two broods, and these produced significantly more young per season than did pairs attempting only one brood; mean lifetime breeding success expressed as total young fledged 4.3 (range 0–31), expressed as total young successfully recruited to breeding population 0.45 (range 0–3). First breeding at 1 year in 70% of cases, sometimes 2 years (16%) or 3 years (7%); mean age at first nest attempt 1.5 years. Average longevity from ringing studies 3.3 years, males living longer than females; adult annual survival of known breeders 64% for males, 59% for females; juvenile survival to recruitment 21.9%.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Abundant in cismontane shrublands, especially coastal scrub and chaparral. Range may be expanding to E & NE with deforestation, resulting in more shrubby cover. Density of breeding adults positively correlated with previous winter's rainfall and with breeding success in previous spring. Population seemingly regulated by availability of scrub and chaparral-type habitat; proximity of urban areas and reduction in size of suitable patches are linked to local reduction in abundance and local extinction. Low-level, prescribed burning appears to improve shrub diversity and cover complexity, and is associated with subsequent increases in nesting success.

**Bibliography.** Baker *et al.* (1995), Baptista (1972), Bolger, Alberts & Soule (1991), Bolger, Patten & Bostock (2005), Bowers (1959, 1960), Brown (1959), Browning (1992), Cody & Brown (1969), Dawson (1923), DeSante (1981), Eakin (1942), Erickson (1938), Flannery & Gardali (2000), Fleischer *et al.* (1985), Friedmann *et al.* (1977), Geupel (1981, 1993), Geupel & Ballard (2002), Geupel & DeSante (1990), Gilligan *et al.* (1994), Grinnell (1913), Howell & Webb (1995), Jewett *et al.* (1953), Kjelson (1988), McMonagle (1992), Minsky (1976), Patten & Bolger (2003), Phillips (1986), Preston & Rotenberry (2006), Sibley & Ahlquist (1982b), Silkey *et al.* (1999), Small (1994), Soule *et al.* (1988).

## Genus LIOPARUS Oates, 1889

### 7. Golden-breasted Fulvetta

#### *Lioparus chrysotis*

French: Fulveta à poitrine dorée

German: Goldalceippe

Spanish: Fulveta Dorada

Other common names: (Himalayan) Golden-breasted Tit-babbler

**Taxonomy.** *Pr[oparus]. chrysotis* Blyth, 1845, no locality = Nepal.

Genus commonly merged with *Alcippe*. Birds reported from C Yunnan (N Ailao Shan), in S China, have not been assigned to race. Six subspecies recognized.

**Subspecies and Distribution.**

*L. c. chrysotis* (Blyth, 1845) – C Nepal E to NE India (W Arunachal Pradesh) and adjacent S China (SE Xizang).

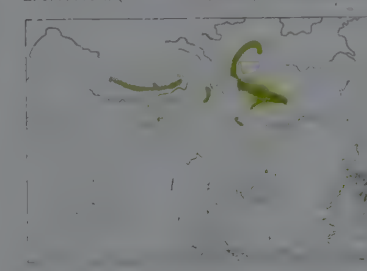
*L. c. albilineatus* Koelz, 1954 – NE India (S Assam, Nagaland, Manipur).

*L. c. forresti* Rothschild, 1926 – NE Myanmar and S China (NW Yunnan).

*L. c. swinhoei* (J. Verreaux, 1870) – S China from SE Gansu, S Shaanxi and C Sichuan S to Guangxi, SE Hunan and N Guangdong.

*L. c. amoensis* (Mayr, 1941) – S China (SE Yunnan) and NW Vietnam (W Tonkin).

*L. c. rohsoti* (J. C. Eames, 2002) – C Vietnam (C Annam).



**Descriptive notes.** 10–11.5 cm; 5–10 g. Colourful fulveta, blackish-grey above with silvery ear-coverts and orange-yellow underparts. Wing flashes and outer tail. Male nominate race has lores, forehead, crown and supercilium blackish, with paler bluish-grey in vague line (variable in intensity) down centre; nape bluish-grey, but more blackish at side; upperparts bluish-grey, more olive-tinged on back, rump and uppertail-coverts, latter more yellow-olive and tipped paler; uppertail blackish, each feather having orange-yellow outer fringe on basal two-thirds; upperwing-coverts blackish, tertials blackish with broad white inner fringes. Flight-feathers blackish on inner vanes but outer vanes of inner primaries yellow and those of outer secondary orange-yellow (forming double wing flash), ear-coverts silvery-grey with darker shaft, chin and upper submoustachial area blackish-grey, becoming bluish-grey on lower throat and behind ear-coverts; underparts bright orange-tinged yellow, deeper based at sides breast and flanks, very hazel to brown, bill pale bluish-pinkish, with upper mandible orange-banded. Sexes dissimilar, coloured to dull orange. Female is like male but may be paler orange-yellow. Young of *forresti* has throat yellow. Race *albilineatus* has conspicuous white median crownstripe and richer







**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Found in pairs or small parties, often in association with other species, including other babblers, in mixed flocks.

**Breeding.** Occupies breeding elevations May–Sept in Bhutan. No further information.

**Movements.** Resident; some clear seasonal altitudinal displacements, at least in Bhutan.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Eastern Himalayas EBA. Uncommon in E Bhutan; locally fairly common in India, where present in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Fairly common in SE Xizang (China).

**Bibliography.** Ali & Ripley (1972), Cheng Tsohsin (1987), Choudhury (2003), Grimmett *et al.* (1998), Katti *et al.* (1992), Ludlow (1951), Ludlow & Kinnear (1937, 1944), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robson (1986), Singh (1995), Spierenburg (2005), Stattersfield *et al.* (1998), Yen Kwokying (1936).

## 10. Grey-hooded Fulvetta

### *Fulvetta cinereiceps*

**French:** Fulvetta à gorge rayée **German:** Braunkopfalcippe **Spanish:** Fulveta Encapuchada  
**Other common names:** Brown-headed Tit-babbler; Chestnut-backed Fulvetta (*fucata*); Fujian Fulvetta (*guttaticollis*)

**Taxonomy.** *Siva cinereiceps* J. Verreaux, 1870, “les montagnes du Thibet chinois” = Muping [Paohing], south-east Xizang, China.

Genus commonly merged with *Alcippe*. Formerly treated as conspecific with *F. manipurens* and *F. formosana*, but these exhibit considerable differences. Races *fucata* and *guttaticollis* may represent two additional species; further study required. Four subspecies recognized.

**Subspecies and Distribution.**

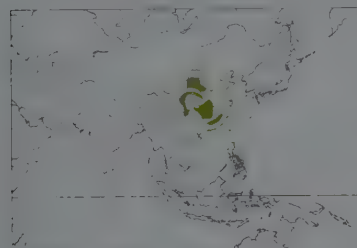
*F. c. fessa* Bangs & J. L. Peters, 1928 C China (S Ningxia S to S Gansu, S Shaanxi and extreme N Sichuan).

*F. c. cinereiceps* (J. Verreaux, 1870) – NE, C & S Sichuan S to W Guizhou (SC China).

*F. c. fucata* (Styan, 1899) – W Hubei S to N Guizhou, NE Guangxi and SE Hunan (E China).

*F. c. guttaticollis* (La Touche, 1897) – SE China from NW Fujian S to N Guangdong.

**Descriptive notes.** 12 cm. Small brownish, plain-headed and nondescript Fulvetta with ochre, black and whitish in wing. Nominative race has crown and mantle pale soft greyish, slightly darker, browner lores and vague supercilium or lateral crownstripe, shading to mid-brown back and ochreous-rufescent rump, upperside-coverts, outer webs of secondaries and outer fringes of tail; wing and tail otherwise mid-brown, former with blackish and greyish-white wingpanel; side of face and neck a shade paler and vaguely pinker than crown; chin, throat, breast, mid-belly and thighs greyish-white, breast with vestigial streaking,



flanks and vent ochreous-tan; iris pale straw, pinkish-yellow, yellowish-brown or brown; bill black to dark brown, or light brown; legs dark brown to greyish-brown or brownish-flesh. Sexes similar. Juvenile is presumably as adult. Race *fessa* is very like nominate, but slightly less reddish, more olivaceous, above; *guttaticollis* has pale vinous-brown crown, very vague smoky-brown lateral crownstreaks, black outer vane of secondaries, and more obvious but still indistinct pale grey streaking on breast; *fucata* is like last, but crown richer brown, back chestnut-brown, breast streaking barely apparent. Voice. Song (nominative race) a loud, high, thin, breathless, whistled “ti fuu fiuu” or “ti wuu wiiuu” (first note rising, second slightly descending, third rising and then falling), repeated every 5–7 seconds. Calls with sibilant, thin, quavering churring rattle.

**Habitat.** Undergrowth and bamboo in broadleaf forest, spruce, fir and maple forest, secondary growth, scrub, brambles and bamboo; 1400–3400 m (mostly above 1700 m) in summer, locally as low as 1000 m in winter.

**Food and Feeding.** Insects, caterpillars, and small molluscs. Forages actively and with agility, in manner of a tit (Paridae).

**Breeding.** Season Apr–Jun. Nest a neat cup, strongly woven from bits of leaf skeleton, leaves, grasses and moss, lined with tendrils, placed in fork of low bush or dwarf bamboo. Clutch 4 or 5 eggs, pale greenish to bluish-green with brownish-green spots and blotches over brown, lilac and grey undermarkings. No other information.

**Movements.** Resident; reportedly a winter visitor to Guangdong, but this improbable.

**Status and Conservation.** Not assessed. Common and widespread in S China, although in one survey recently recorded only in Maershan Nature Reserve (Guangxi) and not in 53 other sites visited; is, however, present at Emei Shan Protected Scenic Area and Wa Shan and in Jiuzhaigou and Wolong Nature Reserves, all in Sichuan.

**Bibliography.** Bangs & Peters (1928), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1993), Collar (2006), Deditius (1897), Dowell *et al.* (1997), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Yan (1988), King (1989b), La Touche (1899, 1925–1930), Lee Kwok Shing *et al.* (2006), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Meyer de Schauensee (1984), Ripley (1952), Ripley *et al.* (1991), Smythies (1986), Stanford & Ticehurst (1935, 1938), Stresemann (1923c), Vaurie (1954b), Wang Zhijun (1983), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yen Kwokying (1936), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zheng Baolai (1988), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1987).

## 11. Streak-throated Fulvetta

### *Fulvetta manipurens*

**French:** Fulvetta du Manipur **German:** Streifenkehlalcippe **Spanish:** Fulveta de Manipur  
**Other common names:** Manipur Fulvetta

**Taxonomy.** *Proparus manipurens* Ogilvie-Grant, 1906, Owenkulno Peak, Manipur, India. Genus commonly merged with *Alcippe*. Formerly treated as conspecific with *F. cinereiceps* and *F. formosana*. Two subspecies recognized.

**Subspecies and Distribution.**

*F. m. manipurens* (Ogilvie-Grant, 1906) – NE India (E Arunachal Pradesh S to S Assam and N Manipur), W & N Myanmar and S China (W Yunnan).

*F. m. tonkinensis* (Delacour & Jabouille, 1930) – S China (SE Yunnan) and N Vietnam (W Tonkin).

**Descriptive notes.** 11–12 cm. Small. Nominative race has greyish, mantle and back pinkish-milky brown, buff-headed, buff-throated, lateral crownstreaks becoming narrow broad streaks, rump, lower back and rump pale rufous; tail milky brown, upperside similar but with pale rufous fringes and



of inner primaries, paler bill. Sexes similar. Juvenile apparently resembles adult. Race *tonkinensis* has darker lateral crownstreaks, slightly more contrasting pattern of throat streaks, and slightly richer rust colour on lower underparts. Voice. Song a rather well-spaced, very high-pitched “ti ti si su”; transcribed also as a simple, sibilant, high-pitched “si-swu” or “see, si-wu”, the “si” note(s) clear and the last note burr, as “si-seé-swú”, all notes thin and sibilant, and as “si-si-suu-swéé”, the last note more stressed, prolonged, slurred, and with greater bandwidth than the others. Calls include low “tirru” notes when on the move, also high, thin, sibilant “swi-swi-swi-swi...”, and thin, dry, metallic “twit-it-it-it-it-it-it...” or harder, more spluttering rattled version.

**Habitat.** Broadleaf evergreen forest, forest edge, bamboo and scrub; at 1400–2500 m in India, 1525–2800 m in SE Asia.

**Food and Feeding.** Mainly small insects and their eggs, caterpillars, tiny snails, some vegetable matter. Found in parties of 6–10 individuals outside breeding season, often associating with mixed flocks which may contain other small babblers. Forages quite close to, and sometimes on, ground; sometimes ascends in trees.

**Breeding.** Apparently from Apr in India. Nest a well-built, strongly woven, small cup made of leaf skeletons, bamboo and other leaves, and grasses, bound with moss, lined with tendrils or soft shiny black fibres, placed in fork of low bush or dwarf bamboo. Clutch 3–5 eggs, 4 or 5 in India, pale greenish or sea-green, blotched and spotted with brownish over underlying violet, lilac and grey clouds and some short brown hair-lines. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Generally scarce to rare. Found very sparingly in survey of E Arunachal Pradesh (India) in spring 1990. Locally common in China and Vietnam; present in Fan Si Pan National Park, in Vietnam.

**Bibliography.** Ali & Ripley (1972), Cheng Tsohsin (1987), Choudhury (2003), Collar (2006), Delacour & Jabouille (1930, 1931a), Grimmett *et al.* (1998), Katti *et al.* (1992), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Singh (1995), Smythies (1949), Stanford (1935, 1941), Stanford & May (1941), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Yen Kwokying (1936).

## 12. Taiwan Fulvetta

### *Fulvetta formosana*

**French:** Fulvetta de Taiwan **German:** Taiwanalcippe **Spanish:** Fulveta de Formosa

**Taxonomy.** *Proparus formosanus* Ogilvie-Grant, 1906, Mount Morrison, central Taiwan.

Genus commonly merged with *Alcippe*. Formerly treated as conspecific with *F. cinereiceps* and *F. manipurens*. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 12 cm; mean 10 g. Has crown to back milky grey-brown, soft-edged but broad mid-brown lateral crownstreaks continuing onto mantle; lower back and rump pale rufous, upperside and tail grey-brown with pale rufous fringing, rufous forming strong panel on secondaries above narrow black wingpanel (inner primaries) and narrow whitish panel (outer primaries); lores to eye grey sooty grey, eyering whitish, cheek and ear coverts grey-brown; chin to breast whitish with soft-edged but rather broad milky-brown streaks, shading to plain pinkish grey-brown on belly and upper flanks, rufous-tinged olive-brown lower flanks to vent; iris pale golden-brown; bill pale pinkish-grey to pale brown; legs pale brown. Differs from similar *F. manipurens* in having black lores, white eyering, more extensive and pronounced throat and breast streaking, much weaker lateral crownstripe, more olive lower belly and flanks, stronger rufous wingpanel, and pink-tinged throat. Sexes similar.

Juvenile apparently resembles adult. Voice. Song “ti tuuu”, first note rising, second descending, typically repeated every 3–6 seconds, of similar quality to song of *F. manipurens*. Calls squeaky contact call a thin high “shiiip...shiiip” or “tsee-tsee”.

**Habitat.** Undergrowth and bamboo understorey of coniferous forest, underbrush of deciduous forest and adjacent open low montane vegetation, at 2130–2400 m, breeding mainly in alpine bamboo and pinewood undergrowth; elevational limits in N Taiwan 1590–3000 m.

**Food and Feeding.** Insects and seeds found in stomachs. Forages in pairs or small groups, on or just above the ground; sometimes rather mouse-like.

**Breeding.** May–Jul. Clutch 2 eggs. No further information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Fairly common to common. In Yushan National Park, recorded densities of 1.99 birds/ha in grassland, 9.15/ha in pine woodland, 9.42/ha in mixed coniferous woodland and 3.19/ha in spruce forest.

**Bibliography.** Collar (2006), Collar (2004, 2006), Collar *et al.* (2004), Ding Lianmei *et al.* (2004), Hamaoka & Udagawa (1950, 1951), Koh (haonien & Lee Peifen (2003), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Yang Xiusing (1991), Yen Chungwei (1990), Yen Kwokying (1936).

## 13. Chinese Fulvetta

### *Fulvetta striaticollis*

**French:** Fulvetta montagnarde **German:** Bergalcippe **Spanish:** Fulveta China  
**Other common names:** Streak-throated Tit-babbler



**Taxonomy.** *Siva striatocollis* J. Verreaux, 1870, "les montagnes du Thibet chinois" = Muping [Paohing], south-east Xizang, China.  
Genus commonly merged with *Alcippe*. Monotypic.

**Distribution.** S China: S Gansu S to SE & E Xizang, extreme NW Yunnan and W & C Sichuan.



**Descriptive notes.** 11.5 cm. Relatively drab small fulvetta, brown above, whitish below, with streaks on throat and breast. Crown and nape are buffish-tinged or biscuit-tinged mid-brown, feathers of forehead and crown with faint brown streaks (and forehead looking slightly grey-tinged from certain angles); long brown lateral crownstripe from above eye across upper mantle, most prominent on side of nape and upper mantle; rest of upperparts and tail like crown, with tertials, secondaries and upperwing-coverts warm brown on outer vanes, primaries showing narrow grey wing-panel between pale brown outer feathers and

brown inner feathers; lores dark brown, slightly greyish vague supercilium from above eye to above rear ear-coverts, ear-coverts as crown but streaked pale greyish or buffy; chin, submoustachial area, throat and upper breast off-white with brownish streaks, rest of underparts pale greyish-white, lower flanks and undertail-coverts mixed with light brown; iris white to cream-yellow or lemon-yellow; upper mandible horn-brown to dark horn-brown, lower mandible paler to fleshy-pink; legs horn-brown to fleshy-brown or livid. Sexes similar. Juvenile is darker above and duller below than adult. Voice. Song a simple "ti tsew" or "tsi chuu", first note rising, second one falling. Calls with short low rattles, "trrrt-t", "chrrr-r'r't" and the like, sometimes continuously.

**Habitat.** Shrubbery, rhododendron, and prickly oak (*Quercus ilex*), at 2200–4300 m; 2775–4265 m in summer in Xizang.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Forages in pairs or small groups, low down in vegetation.

**Breeding.** Season Jun–Jul in Xizang, Jul–Aug in rest of range. Nest made of grass, covered with moss and lichen on outside, lined with hair, suspended from branch of bamboo. Clutch 4 eggs. Nests preyed on by yellow-bellied weasel (*Mustela kathiah*). No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally common; present in Jiuzhaigou Nature Reserve, in N Sichuan.

**Bibliography.** Ali & Ripley (1972), Bangs & Peters (1928), Cheng Tsohsin (1987), King (1989c), King & Peng Jilai (1991), Lee Thehhow *et al.* (1965), Li Guiyuan *et al.* (1976), Ludlow (1951), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1986), Schäfer & Meyer de Schauensee (1938), Sien Yaohua *et al.* (1964), Stresemann (1923c), Weigold (1925), Yen Kwokying (1936).

## 14. Spectacled Fulvetta

### *Fulvetta ruficapilla*

**French:** Fulvetta de Verreaux **German:** Rotscheitelalcipe **Spanish:** Fulveta de Verreaux

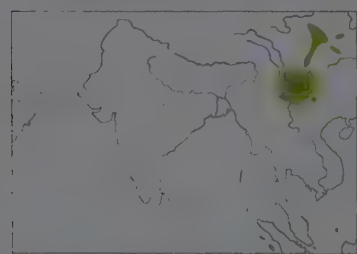
**Taxonomy.** *Siva ruficapilla* J. Verreaux, 1870, "les montagnes du Thibet chinois" = western Sichuan, China.

Genus commonly merged with *Alcippe*. Formerly treated as conspecific with *F. danisi*. Birds recorded in S China (Yunnan and Guizhou) probably belong in present species on basis of range, but not yet compared with type of *F. danisi*. Two subspecies recognized.

**Subspecies and Distribution.**

*F. r. ruficapilla* (J. Verreaux, 1870) – C China (S Gansu and S Shaanxi S to SC & NE Sichuan).

*F. r. sordidior* (Rippon, 1903) – S China (W & C Yunnan E to SW Sichuan and W Guizhou).



**Descriptive notes.** 10.5–11 cm; 8–10 g. Small, soft-coloured fulvetta. Nominat race has forehead mid-grey, shading to dull vinous-rufous on crown, becoming pinkish-grey on nape, neck side and mantle, and warm ochrous-brown on back, rump and uppertail-coverts; outer fringes of upperwing-coverts, tertials, secondaries and outer tail rufous-ochre, upperwing and tail plain mid-brown, primaries showing narrow grey wing-panel between pale brown outer feathers and brown inner feathers; lores blackish, this colour running up in front of eye to become narrow dark lateral crownstripe, bordered below by increasingly

broad pale grey supercilium; submoustachial area, area below eye and ear-coverts pale vinous-

pinkish; throat whitish with mid-greyish streaks extending onto upper breast; upper flanks and across breast pale pinkish-grey, middle belly whitish, lower flanks and vent rufous-ochre; iris dark brown, whitish eyering broken at rear; bill grey-brown, lower mandible paler; legs dark brown. Sexes similar. Juvenile presumably resembles adult. Race *sordidior* has crown a little less reddish, ear-coverts a little paler, lateral crownstripes broader, blacker and longer (extending to rear of nape), mid-belly tinged buff, lower flanks and undertail-coverts paler and buffier, less rufous. Voice. No information available.

**Habitat.** Broadleaf evergreen oak forest, dense secondary scrub-jungle and brambles, at 1250–2500 m, occasionally to 2800 m. Published statements of occurrence at elevations to 4000 m considered unreliable.

**Food and Feeding.** Invertebrates, including grubs, scaly-winged insects; also seeds. Found singly or in pairs, also in parties of up to ten or more individuals. Forages low down or in canopy of small trees.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Uncommon to locally common; range appears to be considerable.

**Bibliography.** Bangs & Peters (1928), Cheng Tsohsin (1987), Collar (2006), Deditius (1897), La Touche (1923), Meyer de Schauensee (1984), Riley (1926), Stresemann (1923c), Tan Yaokuang & Cheng Tsohsin (1964), Vaurie (1954b), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yen Kwokying (1936), Zheng Baolai (1988), Zheng Zuoxin & Qian Yanwen (1973).

## 15. Indo-Chinese Fulvetta

### *Fulvetta danisi*

**French:** Fulvetta de Danis **German:** Streifenwangenalcipe **Spanish:** Fulveta Indochina

**Taxonomy.** *Alcippe (Fulvetta) ruficapilla danisi* Delacour & Greenway, 1941, Phu Kobo [19°16' N, 103°25' E], Laos.

Genus commonly merged with *Alcippe*. Until recently treated as conspecific with *F. ruficapilla*. Birds of S China (Yunnan and Guizhou) provisionally placed in race *sordidior* of *F. ruficapilla* on basis of range, but not yet compared with type of present species. Two subspecies recognized.

**Subspecies and Distribution.**

*F. d. danisi* (Delacour & Greenway, 1941) – NE & EC Laos.

*F. d. bidoupensis* (J. C. Eames *et al.*, 1995) – SE Laos and C Vietnam (C & S Annam).



**Descriptive notes.** 11.5 cm; 9–13 g. Nominat race has crown to mantle greyish-brown, long blackish-brown lateral crownstripe; back and rump to uppertail rufous-brown, upperwing rufous-brown, outer primaries with greyish-white fringes forming narrow wing-panel; lores and supercilium whitish, cheek and ear-coverts tan; chin to upper breast pinkish-buff with vague tan streaks, lower breast pinkish-buff, shading to white on belly and to rufous on flanks and vent; bare-part colours of nominat undescribed, for race *bidoupensis* iris medium to dark brown, bill fleshy-horn to dark horn, usually with more flesh-coloured base, legs dark greyish-flesh to dark horn. Differs from similar *F. ruficapilla* mainly in having crown darker and greyer, wings plainer, throat and upper breast pinkish-buff with darker streaks. Sexes similar. Juvenile undescribed. Race *bidoupensis* has browner crown than nominat, no whitish fringes on primaries (wing-panel entirely absent). Voice. Song undocumented; possible song (singer unseen) transcribed as "see-sew-see-see". Calls with quickly repeated, rapid "chrrrrit" and "chrrt-chrrt-chrrt...".

**Habitat.** Bamboo, undergrowth and understorey, sometimes also canopy, in broadleaf evergreen forest and secondary scrub in cleared areas, oak and rhododendron forest, shrubs in clearings and along forest edge; in Laos low-stature upper montane forest. Elevation limits 1800–2440 m.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Found singly, in pairs or in small parties of up to eight individuals. Race *bidoupensis* seen in single-species flocks.

**Breeding.** No information.

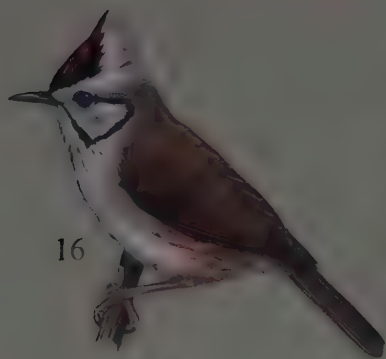
**Movements.** Resident.

**Status and Conservation.** Not assessed. Locally common within relatively small range. In Laos, present in Nakai-Nam Theun National Biodiversity Conservation Area and very common in Xe Sap proposed protected area. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam), and in Vu Quang Nature Reserve.

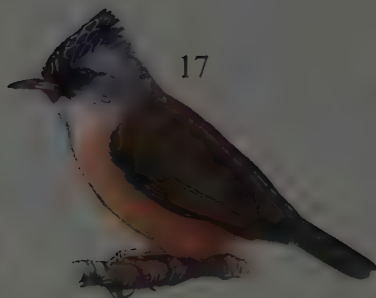
**Bibliography.** Cheng Tsohsin (1987), Collar (2006), David-Beaulieu (1944), Delacour & Greenway (1941), Eames (1995), Eames, Eve & Tordoff (2001), Eames, Robson & Nguyễn Cu (1994), Evans & Timmins (1998), Meyer de Schauensee (1984), Robson (2000), Thewlis *et al.* (1998), Wu Zhikang *et al.* (1986).







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*ssp. flavicollis*

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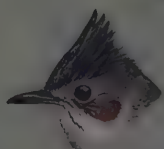
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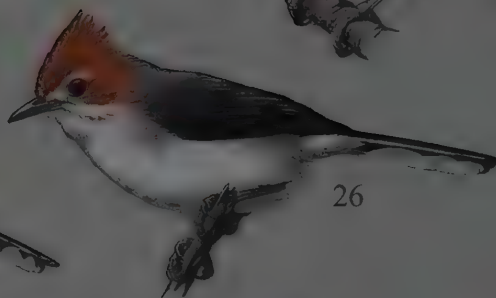
*ssp. albicollis*



*ssp. plumbeiceps*



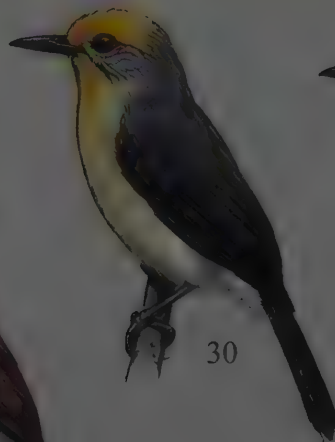
*ssp. castaneiceps*



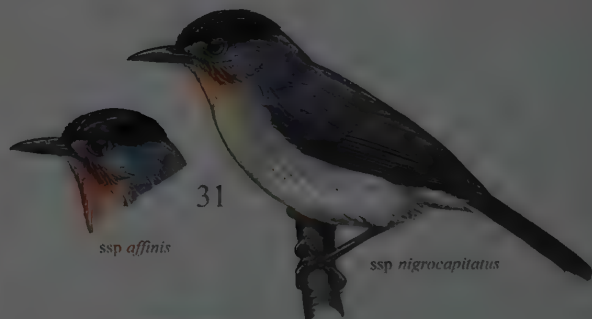
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*ssp. affinis*

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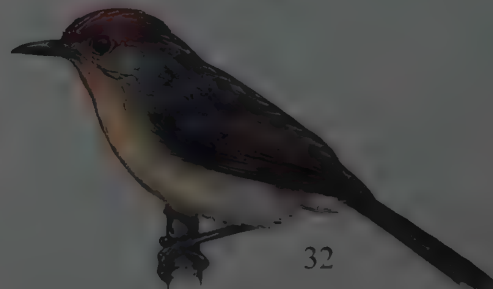
*ssp. nigrocapitatus*



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# Genus *YUHINA* Hodgson, 1836

## 16. Taiwan Yuhina

### *Yuhina brunneiceps*

**French:** Yuhina de Taiwan **German:** Braunkopfyuhina **Spanish:** Yuhina de Formosa  
**Other common names:** Formosan Yuhina

**Taxonomy.** *Yuhina brunneiceps* Ogilvie-Grant, 1906, Mount Morrison, central Taiwan. Monotypic.  
**Distribution.** Taiwan.



**Descriptive notes.** 11.5 cm; mean 12 g. Distinctive yuhina with dull brown crest with black lateral crownstripe, olive-brown upperparts and whitish underparts, and thin, rather long bill. Forehead and erectile crown feathers are dull chestnut-brown, some underlying feathers whitish (visible when crest raised), distinct black lateral crownstripe from bill base to hindcrown; nape and upperparts greyish olive-brown, upperwing and tail mid-brown with paler buffy-whitish fringes; head side (lores, increasingly broad supercilium, area under eye, ear-coverts) whitish, narrow black eyestripe from behind eye and looping around lower edge of ear-coverts and cheek to form broken submoustachial stripe; whitish below, washed grey on breast side and upper flanks, with narrow blackish shaft streaks on lower throat and breast, long but irregular and variable brown streaks on lower flanks, thighs olive-brown; iris red to dull red; bill black; legs yellowish-brown to yellowish. Sexes similar. Juvenile is apparently as adult. **Voice.** Song a jaunty, mellow, sweet "too, mee, jeeoo" ("to meet you", sometimes "so pleased to meet you"), last note a descending slur.

**Habitat.** Deciduous and evergreen broadleaf forest, mixed broadleaf and coniferous forest, sometimes spruce, fir and cedar forest, also forest edge and clearings, at 1200–2400 m in summer, some descending to 1000 m or lower in winter; in N Taiwan, elevational limits 805–2780 m. In one study in fragmented habitat during breeding period, preferred woods, open spaces and orchards in that order, but within home ranges preferred orchards to open spaces, and cherry trees (*Prunus*) appeared to be selected as food resource.

**Food and Feeding.** Nectar of cherry blossoms and other flowers reported; doubtless also small invertebrates and probably small fruit. Found in stable small parties typically of 3–7 adults (most commonly four) throughout year. Forages in lower strata to canopy. Very mobile, and will cross large open areas.

**Breeding.** Apr–Jun; up to three broods per season (span of brood cycle from nest-building to independence of young 70 days). Has habit of communal nesting, three or four pairs may lay in one nest and incubate eggs in turn. Pair socially monogamous, but in one study 20% offspring were sired by a male from another group and 20% by another male from within group; inter-group cuckoldry affected 6 out of 12 nests and intra-group cuckoldry affected 8 out of 12 nests. Large groups have larger home ranges. Nest built by both sexes in group, but with more input from females, a small deep cup, made of roots, bits of fern, moss and cobweb, lined with fern leaves, placed among thick branches of *Arundinaria* bamboo. Clutch 2–3 eggs, pale greenish-blue, marked all over with small greenish or buffish-brown freckles over underlying grey freckles; incubation period 14 days; nestling period 12 days. Maximum recorded longevity 12 years; c. 24–30% of birds at one site disappeared annually (through emigration or mortality); estimate of average adult annual overwinter survival 74%.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Taiwan FBA. Common to abundant in C highlands, commonest at middle elevations. In Yushan National Park, recorded densities of 1–12 birds/ha in grassland, 2–48/ha in pine woodland, 8–84/ha in mixed coniferous forest and 2–03/ha in spruce forest (none of these being optimal habitat for the species).

**Bibliography.** Cheng Tsohsin (1987), Ding Tzungsu *et al.* (1997), Ebert (1986), Fang Wei-hong (2005), Hachisuka & Udagawa (1950, 1951), Hung Hsiyi (2003), Koh Chaonien & Lee Peifen (2003), Kraus (1985), Lee Peifen *et al.* (2005), Liu (1999), Meyer de Schauensee (1984), Ogilvie-Grant (1906), Severinghaus & Blackshaw (1976), Shen Shengfeng (2002), Smith & Yu Hontsen (1992), Stattersfield *et al.* (1998), Yamashina (1938), Yen Chungwei (1990), Yu Hontsen & Lin Liang-kong (1985), Yuan Hsiaowei, Liu & Shen Shengfeng (2004), Yuan Hsiaowei, Shen Shengfeng & Hung Hsiyi (2006), Yuan Hsiaowei, Shen Shengfeng, Lin Kai-ying & Lee Peifen (2005).

## 17. Black-chinned Yuhina

### *Yuhina nigripenta*

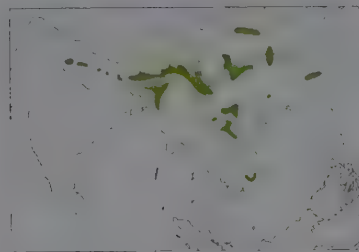
**French:** Yuhina à menton noir **German:** Meisenyuhina **Spanish:** Yuhina Barbinegra  
**Other common names:** Pale Yuhina

**Taxonomy.** *Yuhina nigripenta* Blyth, 1845, Nepal.

Geographical variation clinal, with slight increase in size and underpart pallor from E to W. Proposed races *intermedia* (from NE Myanmar and C & S China S to N Laos and S Vietnam) and *pallida* (highlands of Fujian, in SE China) appear to represent middle stage and end, respectively, of this cline. Treated as monotypic.

**Distribution.** From N India (E from Kumaon, in Uttaranchal Pradesh) E to all NE hill states and N & W Myanmar, adjacent SE Xizang (Zayu), C, S & SE China (N & NE Sichuan, E Jiangxi, S Zhejiang, NW Fujian, Yunnan, Guangxi), N & C Laos, Vietnam (Tonkin, N & S Annam) and extreme E Cambodia.

**Descriptive notes.** 9–10 cm; 8–14 g. Smallest yuhina, dull greenish grey-brown above and buff below, with blackish face and crest on dull grey head, narrow red bill. Has crown mid-grey, slightly



brown-tinged, with broad blackish centres, feathers slightly elongate (forming low crest); upperparts, upperwing and tail drab greenish grey-brown, washed greyer on mantle and warmer on rump; lores to above eye, upper submoustachial area and chin black, ear-coverts and supercilium plain grey like nape, throat white with slight buffy tinge; underparts dirty buff, richer on lower flanks and vent, with breast side, upper flanks and thighs washed mid-brown; iris hazel or brown to dark crimson; upper mandible horn-brown to black with reddish base, lower mandible orange-red, coral-red or vermillion; legs yellowish-brown or orange-flesh. Sexes similar. Juvenile has upperparts and edges of wing and tail browner, crest shorter. **Voice.** Song remarkable, a clear thin high-pitched sequence of short sibilant ringing whistles, "uu ii uui ii uui uu ii uui uu ii uui...", with higher "ii" notes; other versions include "seet, suet, seet, seet...", in no set pattern, and an even-tempo sequence of very short thin even-pitched notes, "sit-sit-sit-sit...". Calls include a subdued, light, musical staccato chattering and titting (heard continuously from flocks), occasionally becoming a louder nervous harsh "whit'rr'u", "wh'rr'r" and "whrr'rr'ik"; also a near-continuous metallic "pik! pik! pik!..." mixed with other notes.

**Habitat.** Broadleaf evergreen forest, second growth, and overgrown clearings. Mostly at 350–1825 m in India, sometimes down to 100 m in Assam, and recorded at 2500 m at Eaglenest Wildlife Sanctuary; 610–1500 m in Nepal; 400–2000 m, occasionally down to 300 m and up to 2300 m (once 2800 m), in Bhutan; 300–2300 m in China, but 1650–1700 m in SE Xizang; 200–2135 m in SE Asia.

**Food and Feeding.** Insects and their larvae (including millers, moth pupae), berries, seeds (including those of grass), rice, and flower nectar; ingests some grit, including quartz. In Aug–Mar, outside breeding season, found in parties of 5–20 individuals, often in association with mixed flocks. Forages in canopy and low bushes, sometimes in undergrowth or in tall grass under trees.

**Breeding.** Mar–Jul in Indian Subcontinent, May–Jul in Myanmar, Apr–Jun in China (Jul in SE Xizang), and Jan–Feb in Laos; probably multi-brooded, in Bhutan three periods of singing (with reduced flock sizes), in Apr, May and Jul, suggesting highly synchronized breeding (pair with young in Aug). Nest, constructed over at least 3 days, a beautiful compact cradle or basket made of moss and moss roots or other fibrous material, lined with very fine grass stems, rootlets and fibres (including coir), either suspended from moss or lichen hanging from underside of branch within 2 m of ground, or fastened to exposed hanging roots on bank or attached to eaves of bamboo-thatched shed or coir-wrapped base of palm branch or even tea plant. Clutch 3–6 eggs, usually 4 in Indian Subcontinent, 3–4 in Myanmar, 4–6 in China, pale sea-green with profuse very pale brown or reddish freckles, or (Indian Subcontinent) occasionally pale clay or clay-green with spots numerous but smaller, or (S China) sparingly and delicately speckled light brown over underlying markings of reddish-grey, violet or lavender; incubation by both sexes, period 12–13 days; nestling period 13–15 days.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon to scarce in Nepal. Common throughout temperate zone and foothills in Bhutan, but scarcer in W; present in Thrumshingla National Park. Generally fairly common locally in India, where rare in Dehra Dun valley (Uttaranchal), present in Buxa Tiger Reserve (West Bengal), and in Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (all Arunachal Pradesh), and rare in Khushi Hills (Assam). Uncommon to scarce resident in SE Bangladesh. Scarce in NE & W Myanmar. In China, locally common in SE, and recently recorded at six of 54 sites surveyed in S, including Diding Nature Reserve (Guangxi), where rare; common in mountains in NW Fujian. Locally common across SE Asian range: present in proposed extension to Nakai-Nam Theun National Biodiversity Conservation Area, in Laos; in Vietnam, common in Tam Dao National Park and present in Na Hang Nature Reserve (E Tonkin), and in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam), also in Pu Mat and Vu Quang Nature Reserves (N Annam).

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Baars (1981), Beils (1956), Birand & Pawar (2004), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Cheng Tsohsin *et al.* (1963), Choudhury (2003), David-Beaulieu (1944), Delacour (1929), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Duckworth & Hedges (1998), Eames (1995), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Hill (2000), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), King (1989a, 1989b), Koel (1954), La Touche (1925, 1930), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Lewthwaite (1996), Li Dehao *et al.* (1978), Li Guiyuan *et al.* (1994), Liu Kezhi *et al.* (1994), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Obernauer (1977, 1978), Painter (1965), Rasmussen & Anderton (2005), Ripley (1952), Robbins *et al.* (2006), Robson (2000), Robson *et al.* (1989), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Singh, A.P. (2000), Singh, P. (1995), Smythies (1986), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914, 1923), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Tordoff *et al.* (2002), Viney *et al.* (1994), Winkendick (1983), Wu Zhikang *et al.* (1986), Yen Kwok yung (1934a), Yu Zhiwei *et al.* (1986), Zheng Zuoxin *et al.* (1983).

## 18. White-collared Yuhina

### *Yuhina diademata*

**French:** Yuhina à diadème **German:** Diademyuhina **Spanish:** Yuhina Diademada

**Taxonomy.** *Yuhina diademata* J. Verreaux, 1869, "le Thibet oriental" = Muping (Paohing), south-east Xizang, China.

Two subspecies recognized.

**Subspecies and Distribution.**

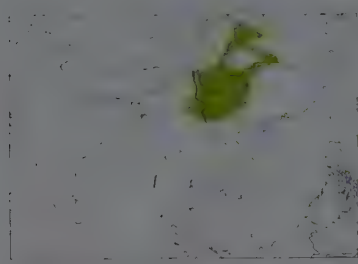
*Y. d. diademata* J. Verreaux, 1869 – C China (S Gansu and Hubei S to Sichuan and Guizhou).

*Y. d. anpelina* Rippon, 1900 – NE Myanmar E to S China (Yunnan) and N Vietnam (Tonkin).

**Descriptive notes.** 14–18 cm, 15–20 g. Relatively large, long-tailed greenish-brown yuhina with dark crest, prominent white nuchal collar and white underwing-coverts, shallowly forked tail. Nomi-

On following pages: 19. Stripe-throated Yuhina (*Yuhina gutaris*); 20. Rufous-vented Yuhina (*Yuhina occipitalis*); 21. White-naped Yuhina (*Yuhina bakeri*); 22. Whiskered Yuhina (*Yuhina flavicollis*); 23. Burmese Yuhina (*Yuhina humilis*); 24. Striated Yuhina (*Staphida castaneiceps*); 25. Chestnut-collared Yuhina (*Staphida torquata*); 26. Chestnut-crested Yuhina (*Staphida everetti*); 27. Flame-templed Babbler (*Dasyeratapha speciosa*); 28. Mindanao Pygmy Babbler (*Sterrhophilus plateni*); 29. Visayan Pygmy Babbler (*Sterrhophilus pygmaeus*); 30. Golden-crowned Babbler (*Sterrhophilus dennistouni*); 31. Black-crowned Babbler (*Sterrhophilus nigrocapitatus*); 32. Rusty-crowned Babbler (*Sterrhophilus capitalis*).





coverts white; iris chestnut to dark brown, white orbital ring broken at front and rear; bill dusky yellow or yellowish with brown culmen; legs yellowish to dusky yellow or orange-yellow. Sexes similar. Juvenile is like adult. Race *ampelina* is darker, more greyish-brown, than nominate. Voice. Calls include subdued, worrisome "wi wrrr" i wrrr wrrr".

**Habitat.** Open broadleaf evergreen forest, secondary growth, and tea plantations; at 800–3600 m in China, 1250–2745 m in SE Asia.

**Food and Feeding.** Insects, including beetles (Coleoptera); also small seeds, rhododendron nectar. Forages in pairs or in small groups.

**Breeding.** Apr–May in Myanmar and May–Sept in China. Nest a flimsy, almost transparent cup made of dry leaves, dry grass and black roots, well plastered with cobweb or moss and roots, lined with rootlets, palm fibre, grass, stalks and strands from parasitic plants, placed low down (0.2–1.5 m above ground) in bush, brambles, wild raspberry, bracken, coarse grass or small tree. Clutch 2–3 eggs, usually 2 in Myanmar, whitish, pale green or greenish-blue, profusely blotched and speckled with amber, brown and bluish-purple or light brown, blackish and purple; incubation by both sexes, mostly by female. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. In China, common at Emei Shan Protected Scenic Area (Sichuan) and very common in S, where present in Cenwanglaoshan Nature Reserve (Guangxi), with daily counts of up to ten individuals. Locally fairly common in Myanmar; fairly common in Fan Si Pan National Park, in Vietnam.

**Bibliography.** Bösche (2005), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Deditius (1897), Delacour & Jabouille (1930, 1931a), Dowell *et al.* (1997), Harington (1909, 1914a), Huang Qiang *et al.* (1995), King (1989a, 1989b, 1989c), La Touche (1923), Lee Kwok Shing *et al.* (2006), Li Guiyuan *et al.* (1993), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Riley (1926), Robson (2000), Rothschild (1926), Smythies (1986), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stresemann (1923c), Tan Yaokuang & Cheng Tsohsin (1964), Traylor (1967), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang, Lin Qiwei *et al.* (1986), Wu Zhikang, Yang Jiongli & Xu Weishu (1981), Zheng Zuoxin & Qian Yanwen (1973).

## 19. Stripe-throated Yuhina

### *Yuhina gularis*

**French:** Yuhina à gorge striée **German:** Kehlstreifenyuhina **Spanish:** Yuhina Goliestriada  
**Other common names:** Eastern Stripe-throated Yuhina

**Taxonomy.** *Yuhina gularis* Hodgson, 1836, Nepal.

Four subspecies recognized.

**Subspecies and Distribution.**

*Y. g. vivax* Koelz, 1954 – N India (Uttaranchal Pradesh).

*Y. g. gularis* Hodgson, 1836 – Nepal, Bhutan, NE India (Arunachal Pradesh, Nagaland, Manipur), S & SE Xizang, W, N & E Myanmar, S China (W, C & S Yunnan), N Laos and N Vietnam (W Tonkin).

*Y. g. omeiensis* Riley, 1930 – C & S China (W, C & N Sichuan S to N & NE Yunnan).

*Y. g. uthaii* J. C. Eames, 2002 – C Vietnam (C Annam).



panel); lores dusky, with blackish band to above eye, head side including supercilium medium brownish-grey; submoustachial area dirty pinkish-buff, chin and throat similar and with regular lines of dark brown streaks and malar line; underparts dirty ochre-buff; iris dark reddish-brown to pale brown; upper mandible dark brown, lower mandible basally brownish-yellow to fleshy-pink; distally dark brown; legs yellow to brownish-flesh or fleshy orange. Sexes similar. Juvenile is slightly darker rufous-brown above, especially on uppertail-coverts, crest shorter. Race *vivax* is paler than nominate, particularly on throat and breast; *omeiensis* is very like nominate, but with greyish-pink breast and upper belly; *uthaii* has whiter throat with much broader streaks. Voice. Typically calls with loud, short, descending, very nasal "mherr" or "wherr" or "skyeer" notes, often in long series and sometimes followed by hurried "whu'whu'whu'whi'whi'whi" (possibly song), sometimes alternated with clearer, quick, upslurred "squik!". Also, short "wiht" notes and a more abrupt descending "squip".

**Habitat.** Temperate oak, birch and rhododendron forest or mixed rhododendron and coniferous forest, occasionally low scrub and bamboo. In Indian Subcontinent, breeds at 2135–3700 m, some descending to 1700 m (rarely 1160 m) in winter, but in Bhutan summer range 2400–3400 m (occasionally to 3600 m) and keeps within this range in winter but also shifting lower (to 1600 m, occasionally 800 m). In China mainly 1200–3050 m, down to 1100 m on Emei Shan; breeds to 3800 m in Xizang. In SE Asia 1675–3200 m.

**Food and Feeding.** Beetles (Coleoptera), wasps (Hymenoptera) and other insects; also berries (e.g. of *Hepiapterum*), flower nectar (of various rhododendrons, *Prunus*, *Magnolia*) and seeds (of *Prunus*, *Magnolia*, etc.); in Feb, also takes sugar-rich sap from bark. Usually found in small par-

ties, often in association with mixed feeding flocks which may contain other small babblers, notably *Y. occipitalis* in period Jan–Apr. Forages in taller bushes and lower branches of trees, sometimes low down. Behaviour somewhat like that of a tit (Paridae), but slower. Regularly visits rhododendron blossoms for nectar.

**Breeding.** May–Jun in India, Jul–Aug in Bhutan, Apr–May in SE Xizang and Mar–Jun in SE Asia. Nest a large, rough ball or dome with side entrance, made of well-interlaced moss, fern and roots, lined with finer roots, placed in branch fork of bush, palm crown, bamboo clump, or between ledges of rocks. Clutch 4 eggs, dingy grey-green or pale green, profusely but not boldly speckled with reddish-brown. No other information.

**Movements.** Resident; some altitudinal descent in winter, most such records after Jan, thereafter moving gradually upslope in time with season of rhododendron flowering.

**Status and Conservation.** Not globally threatened. Common and widespread in Nepal, including in Langtang National Park. Abundant in Bhutan; one of commonest bird species in high-elevation forests, and present in Thrumshingla National Park. In India, although apparently uncommon resident in Garhwal and Mussooree (Uttar Pradesh), common in Himalayas E to Arunachal Pradesh and S to Nagaland and Manipur, and present in Buxa Tiger Reserve (West Bengal) and in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Common in Natmantaung National Park, in W Myanmar. Common in China. Generally common in SE Asian range.

**Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Betts (1956), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Cheng Tsohsin *et al.* (1963), Choudhury (2003), David-Beaulieu (1944), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Eames (2002), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Huang Qiang *et al.* (1995), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), King (1989a, 1989b), Kinnear (1929, 1934), Koelz (1954), Li Guiyuan *et al.* (1976), Ludlow (1951), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), Meyer de Schauensee (1984), Oates (1883), Rasmussen & Anderton (2005), Riley (1926), Ripley (1952), Robson (1986, 2000), Singh (1995), Smythies (1986), Spierenburg (2005), Stanford (1935, 1941), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stresemann (1923c), Stresemann & Heinrich (1940a), Thet Zaw Naing (2003), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Tymstra (1993), Wang Zhijun & Wei Tianhao (1983), Zheng Zuoxin *et al.* (1983).

## 20. Rufous-vented Yuhina

### *Yuhina occipitalis*

**French:** Yuhina à ventre roux **German:** Rotsteifyuhina **Spanish:** Yuhina Ventrirrufa  
**Other common names:** Slaty-headed Yuhina

**Taxonomy.** *Yuhina Occipitalis* [sic] Hodgson, 1836, Nepal.

Two subspecies recognized.

**Subspecies and Distribution.**

*Y. o. occipitalis* Hodgson, 1836 – C & E Nepal and Bhutan E to NE India (Arunachal Pradesh) and adjacent SW China (S & SE Xizang).

*Y. o. obscurior* Rothschild, 1921 – N Myanmar and S China (NW & C Yunnan, SW Sichuan).



**Descriptive notes.** 12–14 cm; 10–16 g. Fairly large greyish-brown yuhina with rufous nape and vent, prominent crest, slightly forked tail. Nominative race has side of forehead pale rufous-buff, forehead with blackish tips, elongate and erectile crown feathers rather dark greyish-brown, central rear crown with slightly greyer tips, those at side broadly tipped rufous-chestnut; upper nape rufous-chestnut, lower nape mid-grey, mantle and back mid-brown with vague pinkish tinge, rump and uppertail-coverts paler, drab olive-brown; tail dark brown, outer fringes paler; upperwing dark brown, but outer fringes of upperwing-coverts,

tertiaries and secondaries slightly warm-tinged mid-brown, primary coverts slightly darker than upperparts; lores dusky, ear-coverts pale pinkish-grey with whitish shaft streaks, rather broken submoustachial streak blackish; chin, throat, breast and area behind ear-coverts pale vinous-pinkish, central belly warm buff, lower belly, thighs and undertail-coverts rufous-tan; iris brown, white orbital ring; bill reddish-brown, reddish-grey or pinkish; legs yellow to dull reddish-brown. Sexes similar. Juvenile has shorter crest than adult, rufous on nape paler, less vinaceous on breast. Race *obscurior* is duller and greyer than nominate, ear-coverts slightly darker and with more contrasting shaft streaks. Voice. Song a simple, weak, rather high-pitched "swi'si'su'su swi'si'si'si'si'su'su...". Calls with short, hard, bouncy, nasal, buzzy notes, "bee", "beebee" and "bzee, bzee-bzeee...", somewhat variable in pitch and duration, repeated irregularly and in chorus.

**Habitat.** Broadleaf evergreen forest, particularly oak–rhododendron forest. In Indian Subcontinent and Xizang, at 2250–3630 m (sometimes to 3900 m) in summer, some descending to 1830 m (occasionally to 500 m) in winter; mainly 3050–3400 m in summer in Nepal; main range in Bhutan 2400–3400 m, occasionally to 3800 m, but in winter down to 1600 m or lower, rarely 400 m. Recorded at 1830–2500 m, locally down to 800 m in winter, in Myanmar. In S China occurs at 1800–3700 m, some descending to 1350 m in winter.

**Food and Feeding.** Mostly insects in summer. Partial to visiting rhododendron blossoms in search of nectar and probably insects; berries eaten in winter, in Feb also sugar-rich sap from bark. In Oct to late Apr, outside breeding season, found in parties of up to 15 (larger flocks generally only in Dec), often associating with mixed feeding flocks which may contain other small babblers such as minlas, fulvettas and yuhinas; associates especially with *Y. gularis*, with which it feeds on flowering trees as they progressively bloom upslope. Forages in high foliage, on moss-covered trunks and branches and in bushes.

**Breeding.** Apr–Jun in Indian Subcontinent. One nest a cup of moss and leaves, lined with fine roots, built into large lump of moss (which formed dome over nest), 1 m up in fork of small tree, another a shallow cup among streamers of black lichen hanging from drooping downswep tips of conifer branch, 4–5 m above ground. Clutch 2 or more eggs. No other information.

**Movements.** Resident; some altitudinal displacement to lower levels in winter.

**Status and Conservation.** Not globally threatened. Common in Nepal, including in Langtang National Park. Common in Bhutan, and present in Thrumshingla National Park. In India, locally fairly common to common from Sikkim E to Arunachal Pradesh, and present in Buxa Tiger Reserve (West Bengal) and in Eaglenest Wildlife Sanctuary and Mouling National Park (both Arunachal Pradesh). Common in Myanmar and China.

**Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2003), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), King (1989a), Ludlow (1951), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Riley (1926), Robson (2000), Singh (1995), Smythies (1940, 1949), Spierenburg (2005), Stanford



& Mayr (1941), Stevens (1923), Tan Yaokuang & Cheng Tsohsin (1964), Tymstra (1993), Wang Zhijun & Wei Tianhao (1983), Zheng Zuoxin *et al.* (1983).

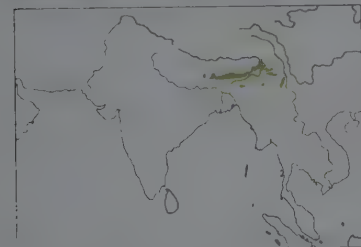
## 21. White-naped Yuhina

### *Yuhina bakeri*

**French:** Yuhina à nuque blanche **German:** Rotkopfyuhina **Spanish:** Yuhina Nuquiblanca  
**Other common names:** Baker's/Chestnut-headed Yuhina

**Taxonomy.** *Yuhina bakeri* Rothschild, 1926, Darjeeling, West Bengal, India. Monotypic.

**Distribution.** E Nepal E to Bhutan, NE India (Arunachal Pradesh S to N Cachar, in S Assam) and N Myanmar, and adjacent parts of China (SE Xizang, NW Yunnan).



**Descriptive notes.** 12–13.5 cm; 14–24 g. Relatively stout-billed yuhina with rufescent-brown head, white nape and throat, silvery-streaked ear-coverts, strong crest. Crown, lower nape, neck side and mantle are dull rufous-brown, feathers of crown elongate and erectile, upper nape broadly white-tipped; upperparts drab mid-brown with dark greyish-olive cast, upperwing and tail browner; lores blackish-brown, ear-coverts plain rufous-brown with broad silvery-whitish streaks, area under eye as crown, submoustachial as crown with whitish flecks; chin and throat whitish with very vague dark marks, merging to slightly pinkish-tinged buff

with vague long dark streaks on breast, flanks drab buffish-olive, central belly whitish, lower belly, thighs and undertail-coverts yellowish-tan; iris reddish-brown to yellowish-brown; bill dark brown to black; legs dull olivaceous to brown. Sexes similar. Juvenile has mantle browner, underparts paler with streaks less distinct. **Voice.** Possible song a hurried series of high thin notes repeated every 1–3 seconds, "tsu tsu tsu" or "du du du", "tsu tsu", and "tsu tsu tsu", etc. Calls include very thin, piercing, high-pitched, short, metallic notes, e.g. "tsit", "sit-sit (...)", "tsu" and "tsit", also a slightly falling "seep"; also "seet-chuut", second note harsh and much lower, reminiscent of common note of *Y. flavicollis* but much less guttural.

**Habitat.** Primary and secondary broadleaf evergreen forest, at 300–2200 m.

**Food and Feeding.** Insects and berries. Found in parties of 5–10 individuals, sometimes 30, outside breeding season; sometimes in association with mixed feeding flocks (with e.g. *Y. flavicollis* and *Alcippe nipalensis*), but forms single-species flocks up to 20. Forages in treetops and bushes.

**Breeding.** Apr–Jul. Nest, built by both sexes, a cup-shaped or dome-shaped structure of moss mixed with dead leaves, roots and bits of bracken, lined with fine rootlets, placed low down in bush, in hollow in bank or against moss-covered tree trunk. Clutch 3–4 eggs, usually 4, white with blotches varying from reddish-brown to deep umber-brown; incubation by both sexes. No other information.

**Movements.** Resident; some seasonal altitudinal displacement.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Himalayas EBA. Very rare and local in SE Nepal. Bhutan probably holds important population, as it contains large areas of intact forest within this species' elevational range, some within protected areas (where highest numbers recorded), and near Zhemgang density of 0.6 pairs/km of road noted at 1600–1900 m; present in Thrumshingla National Park. Locally fairly common in India E from Sikkim, being present in Buxa Tiger Reserve (West Bengal), and reported as being commonest member of this genus in Mouling National Park, and present in and/or near Eaglenest Wildlife Sanctuary and in Namdapha National Park (all in Arunachal Pradesh); locally common in Nagaland, where seen traded in Kohima market. Uncommon in Myanmar. Locally fairly common within restricted range in China.

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2001, 2003, 2005), Grimmer *et al.* (1998), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), Koelz (1954), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1961), Robson (2000), Singh (1995), Smythies (1949, 1986), Spierenburg (2005), Stanford & Mayr (1941), Stattersfield *et al.* (1998), Stevens (1914, 1923), Stuart Baker (1893), Tymstra (1993), Zheng Zuoxin *et al.* (1983).

## 22. Whiskered Yuhina

### *Yuhina flavicollis*

**French:** Yuhina à cou roux **German:** Gelbnackenyuhina **Spanish:** Yuhina Bigotuda  
**Other common names:** Yellow-naped Yuhina

**Taxonomy.** *Yuhina? flavicollis* Hodgson, 1836, central Nepal.

May form a superspecies with *Y. humilis*, and until recently considered conspecific. Five subspecies recognized.

**Subspecies and Distribution.**

*Y. f. albicollis* (Tiechurst & Whistler, 1924) – N India (Himachal Pradesh) E to W Nepal.

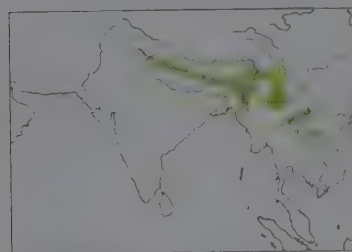
*Y. f. flavicollis* Hodgson, 1836 – C Nepal E to NE India (Arunachal Pradesh) and adjacent S China (SE Xizang).

*Y. f. rouxi* (Dustalet, 1896) – NE India (SE Arunachal Pradesh S to hill states S of R Brahmaputra), W, N & E Myanmar, S China (Yunnan), NW Thailand, N Laos and N Vietnam (Tonkin).

*Y. f. rogersi* Deignan, 1937 – E part of NW Thailand.

*Y. f. constantiae* Ripley, 1953 – NC & C Laos.

**Descriptive notes.** 12–12.5 cm; 10–19 g. Mid-sized yuhina with grey head and crest, golden-yellow hindcollar, black moustache and yellowish-white underside. Nominative race has elongate and erectile crown feathers brown, lateral feathers behind eye, including supercilium, pale greyish-brown, upper nape pale brownish-grey, lower nape and neck side rufous, shading to golden-yellow on hindneck, and fading into yellowish-grey-tinged olive-brown on upperparts; upperwing and tail darker brown; lores blackish-brown, this colour rising over eye and linking below with blackish-brown submoustachial stripe (broken near bill base); ear-coverts slightly glossy silvery brown; chin and throat white with narrow brown shaft streaks, breast washed yellow (fades on museum specimens) with narrow brown shaft streaks, belly washed yellow, breast side and flanks dull buffish olive-brown with long white streaks; vent as flanks but without streaks; iris red-brown to dark brown; prominent broad white orbital ring broken at front and rear, upper mandible horn-brown to dark brown, lower mandible flesh or pinkish-brown to dusky greyish; legs yellowish to fleshy brown; sexes similar. Juvenile lacks streaking below, and colour of nuchal collar indistinct. Race



repeated, shrill, high-pitched "tzii-jhu ziddi", with stressed first note and slightly undulating end note; also as "two-tyurwi-tyawi-tyawa". Calls include thin squeaky "swii swii-swii" and sudden harsh buzzy nasal "jhoh", this sometimes preceded by thin high note, "fzee-tzzip".

**Habitat.** Bush layer and lower storeys of montane broadleaf evergreen forest, oak and open deciduous forest, and secondary growth. In India 1435–1980 m (occasionally to 3000 m) in summer (above 1000 m in Assam), some descending in winter to 500 m and occasionally to edge of plains; in Nepal 1830–2750 m in summer, down to 800 m in winter; in Bhutan 1600–2800 m (occasionally to 3200 m in summer), some descending to 1000 m and even 600 m in winter. In Myanmar 1065–2620 m in summer, some descending to 215 m in winter; 1200–2440 m in Thailand and Indochina, and in C Laos found mainly above 1800 m in upper montane forest but sometimes lower in *Fokienia*-dominated forest. Mainly 1500–3050 m in China, but 2135–2285 m in summer in Xizang.

**Food and Feeding.** Insects and their larvae (including aquatic insects), small snails (including pond snails); also flower nectar, berries (of *Rubus*, including yellow raspberries and yellow blackberries, also *Galium*, *Trema*, etc.) and small seeds (of *Michelia cathartica* and others); feeds on insects parasitic on *Ziziphus*; in Feb takes sugar-rich sap from bark. In Aug–Mar, outside breeding season, found in small parties of 5–10 individuals, sometimes in association with mixed feeding flocks which may include other small babblers. Forages in lower branches of trees and bushes, sometimes low brambles. Behaviour rather like that of a tit (Paridae).

**Breeding.** Apr–Jun. Nest, built by both sexes, a well-made cup mostly of moss, with rootlets, bits of leaves and bracken, thickly lined with rootlets and moss roots, suspended between twigs, or placed among moss on branch, or on bank among roots or tufts of grass, up to 2 m (rarely 4 m) above ground. Clutch 2–4 eggs, white with numerous pink spots; incubation by both sexes, for 13–14 days; young provisioned by both sexes, no information on duration of nestling period.

**Movements.** Resident, with some altitudinal descent in winter; alleged to be a winter immigrant in Nagaland (NE India), but this seems unlikely.

**Status and Conservation.** Not globally threatened. Commonest yuhina in Himalayas, but owing to low elevations rare in Dehra Dun valley and uncommon in Corbett National Park (Uttaranchal), in India; locally common in W Himalayas from Himachal Pradesh E to W Nepal, common in C & E Nepal including Langtang National Park, and E to NE India. In Bhutan abundant, and one of commonest bird species in broadleaf forest in temperate zone; near Zhemgang density of 2.3 breeding pairs/km of road noted at 1600–1900 m; present in Thrumshingla National Park. In E Indian Himalayas present in Buxa Tiger Reserve (West Bengal) and in Eaglenest Wildlife Sanctuary, Namdapha National Park and Mouling National Park (all Arunachal Pradesh). In Myanmar, common in Natmautaung National Park and fairly common elsewhere in country. Common in China. Generally common in SE Asian range: locally common in NW Thailand; present in Phou Dendin National Biodiversity Conservation Area (NBCA) and common in Nakai-Nam Theun, in Laos; present in three protected areas in the Annamese Lowlands Endemic Bird Area, in Vietnam.

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Bangs (1921), Bingham (1903), Birand & Pawar (2004), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Choudhury (2001, 2003), Collar (2006), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Eames *et al.* (2001), Evans & Timmins (1998), Gaston (1989), Gaston *et al.* (1994), Grimmer *et al.* (1998), Harington (1909), Hopwood & Mackenzie (1917), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), Kinnear (1929), La Touche (1923), Lê Manh Hùng *et al.* (2002), Lekagul & Round (1991), Löffing (1984), Ludlow (1951), Ludlow & Kinnear (1944), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952, 1961), Robson (1986, 2000), Rothschild (1926), Round (1999), Schurzinger (1985), Singh, A.P. (2000), Singh, P. (1995), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914, 1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thei Zaw Naing (2003), Thewlis *et al.* (1998), Tizard *et al.* (1997), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Manh Hùng *et al.* (2002), Tymstra (1993), Wang Zhijun & Wei Tianhao (1983), Zheng Zuoxin *et al.* (1983).

## 23. Burmese Yuhina

### *Yuhina humilis*

**French:** Yuhina de Birmanie **German:** Graunackenyuhina **Spanish:** Yuhina Birmana

**Taxonomy.** *Ixulus humilis* Hume, 1877, Mulayit Taung (16°11' N, 98°32' E), Tenasserim, Myanmar. May form a superspecies with *Y. flavicollis*, and until recently considered conspecific. Two subspecies recognized.

**Subspecies and Distribution.**

*Y. h. clarki* (Oates, 1894) – E Myanmar.

*Y. h. humilis* (Hume, 1877) – S Myanmar (N Tenasserim) and W Thailand.



**Descriptive notes.** 12–12.5 cm. Nominative race has crown slightly milky warm mid-brown, nape milky grey-brown, medium-grey neck side and hindcollar, upperparts, upperwing and tail soft warm ochre-tinged brown, head side as crown, but darker on arcs and moustachial line, whitish below, with tiny dark shaft streaks from chin to breast, long pale grey-brown streaks on flanks, and brown-tinged whitish thighs and vent; iris reddish-brown, prominent broad white orbital ring broken at front and rear; upper mandible blackish-brown, lower mandible pale brown; legs fleshy-brown. Differs from *Y. flavicollis* in having browner crown and ear-coverts (crown barely darker than upperparts), soft mid-grey hindcollar, whitish upperparts, faint streaking on chin and throat, and white-centred grey flank feathers. Sexes similar. Juvenile is presumably as adult. Race *clarki* differs from nominate in having forehead, crown and



crest rich umber-brown, rest of plumage ashy, with larger and more conspicuous silvery patch on neck side. *Yuhina* not adequately described. Flock-members utter low "chir-chir", occasionally "chir-chir-chir-chir"; also repeated "chit-a-wit" when alarmed.

**Habitat.** Montane broadleaf evergreen forest, pine and oak forest, at 1075–2275 m.

**Food and Feeding.** Fruit, nectar and insects, last two taken at blossoms of small trees. Found in pairs or small parties.

**Breeding.** Apr in Myanmar and Feb in Thailand. One nest was a "sling" of moss c. 40 cm long, sewn along a twig c. 15 m above ground, with barely noticeable entrance about half-way down; visited by parents alternately, roughly every two minutes.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in (and responsible for defining) Myanmar–Thailand Mountains Secondary Area. Generally uncommon to locally common; scarce to uncommon in Umphang area of W Thailand, and present in Mae Ping National Park and adjacent Mae Tuen and Om Koi Wildlife Sanctuaries. Much of this species' range, however, is adversely affected by forest degradation through selective cutting and repeated burning.

**Bibliography.** Bingham (1903), Collar (2006), Edelman (2006), Hume & Davison (1878), Lekagul & Round (1991), Oates (1894), Robson (2000), Round (1983), Smith *et al.* (1940, 1943), Smythies (1986), Stattersfield *et al.* (1998).

## Genus *STAPHIDA* Gould, 1871

### 24. Striated Yuhina

#### *Staphida castaniceps*

**French:** Yuhina à tête marron

**German:** Rotohyuhina

**Spanish:** Yuhina Estriada

**Other common names:** White-browed/Chestnut-headed Yuhina

**Taxonomy.** *Ixulus castaniceps* F. Moore, 1854. Afghanistan; error = Khasi Hills, Assam, India. Usually placed in genus *Yuhina*. Formerly treated as conspecific with *S. torqueola* and, normally, *S. everetti*. Four subspecies recognized.

**Subspecies and Distribution.**

*S. c. rufigenis* (Hume, 1877) – Sikkim and Darjeeling E to Bhutan and NE India (W Arunachal Pradesh).

*S. c. plumbeiceps* Godwin-Austen, 1877 – NE India (E Arunachal Pradesh S to Nagaland), N Myanmar and S China (W Yunnan).

*S. c. castaniceps* (F. Moore, 1854) – NE Indian hill states (W & S of Nagaland), SE Bangladesh, and W & SW Myanmar.

*S. c. striata* (Blyth, 1859) – E & S Myanmar (including Tenasserim) and NW & W Thailand.



**Descriptive notes.** 13–14 cm; 10–17 g. Small, dull yuhina with short crest, brown above, off-white below, with white-streaked rufous-tan ear-coverts; graduated tail. Nominative race has forehead and crown feathers dull rufous-brown, broadly fringed pale greyish-brown, shading on rear crown and upper nape to plainer rufous-tan; lower nape and upperparts drab greyish-brown with slight pale olive-brown tinge, and very indistinct whitish shaft streaks (virtually invisible); primary coverts, upperwing and tail brown, flight-feathers with pale edges, tail with increasingly large white tips on outer feathers; lores and narrow supercilium buffy whitish, supercilium short and eyebrow-shaped (ending not far behind eye), cheek and ear-coverts rufous-tan with faint and very narrow whitish shaft streaks, submoustachial area and underparts whitish, tinged very pale creamy-buffish; iris reddish-brown to dull crimson, orbital ring dotted whitish; bill pale horn-brown; legs orange-brown to brownish-flesh. Sexes similar. Juvenile is duller than adult, with shorter crest. Races differ mainly in colour of crown (rufous only on nominate) and in strength of upperparts streaks, also in tone of upperparts and underparts: *rufigenis* has crown to upper nape dull mid-grey with darker feather centres, but lateral crownstripe (behind eye) rufescent like ear-coverts, upperparts a shade less rufescent and more obviously marked with white shaft streaks; *plumbeiceps* is similar to previous, but upperparts slightly more greyish-olive, contrasting less with crown, underparts whiter, less buff-tinged; *striata* is also similar, but streaks on crown and upperparts more numerous and more clearly defined, extending to nape and rump, ear-coverts duller and paler, underparts as last. Voice. Song a simple series of high-pitched shrill "tchu", "tchi" or "tchi-chi" notes. Flock-members utter continuous loud chattering, interspersed with squeaky high-pitched notes; calls of nominate race include excited, rapid, dry, short churring trills, irregular sputtery trills and chattering, often in chorus, sometimes oscillating in pitch, tempo and rhythm, also short, clear, slightly nasal peeps.

**Habitat.** Middle storey, scrub and undergrowth of broadleaf evergreen forest, shrubby undergrowth in secondary forest, lower canopy and tall undergrowth. At 300–1590 m in Indian Subcontinent, 600–1600 m in Bhutan; 600–1800 m, locally down to 180 m, in SE Asia.

**Food and Feeding.** Mainly insects (and often visits aphid-infested trees); also seeds, e.g. of the bamboo *Dendrocalamus longispatus*, and nectar. Extremely gregarious all year, with largest flocks (mean 20 individuals) in Aug–Feb, smaller (mean 15) in Mar–Apr, and smallest (mean 8) in May–Jul; sometimes associates with mixed-species foraging parties. Flocks move very quickly in sweeping movements. Forages in higher bushes and lower trees, searching among moss, lichen and loose leaf litter on branches.

**Breeding.** Apr–Jul in India, Mar–Jun in Myanmar and Jan–Mar in Thailand. Nest a compact, more or less stiff, deep cup made of moss, dead leaves, leaf skeletons, grass stems, roots and fibres, lined with very fine soft lichen strands and seed stems, bark fibre, silk-like vegetative matter, palm fibre, soft black fibre, rootlets, hair, coir and moss roots (lining usually fitted within rough outer nest which more or less fully enclosed cavity); placed up to 2 m above ground in unoccupied bee-eater (Meropidae) or kingfisher (Alcedinidae) hole or natural hole in steep bank, often in roadside cutting, or just inside hole in small perennating bank (e.g. on upper side of hill path) or in cavity in rocks. Clutch 2–4 eggs, usually 3 or 4, glossy white or with faint bluish or greenish tinge, with small to large brown or reddish-brown spots, and blotches often mixed with few pale purple spots. Incubation by both sexes, period c. 12 days; no information on nesting period. Nests often preyed on abundantly by tree shrews (*Myiarchus*) in Tenasserim (Myanmar).

**Movements.** Resident; some evidence suggesting seasonal altitudinal displacements, but none proven.

**Status and Conservation.** Not assessed. Fairly common in Himalayan foothills, but not very common in Bhutan, where occasionally recorded in C & E valleys and foothills, and present in Thrumshingla National Park. In India, common in W Nagaland, Manipur and hills of Assam, and present in Buxa Tiger Reserve (West Bengal) and in (at least) Namdapha and Mouling National Parks (Arunachal Pradesh) and Dampa Tiger Reserve (Mizoram). Formerly resident in Bangladesh, but no recent records. Common in W Yunnan (China), in W Myanmar including Natunataung National Park, and in NW & W Thailand including Umphang Wildlife Sanctuary.

**Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Birand & Pawar (2004), Cheng Tsohsin (1987), Collar (2006), Deignan (1963), Duckworth *et al.* (1998), Evans & Timmins (1998), Grimmett *et al.* (1998), Harrington (1914a), Hopwood (1919), Hopwood & Mackenzie (1917), Huang Qiang *et al.* (1993), Hume & Davison (1878), Inskipp & Inskipp (1993b), Inskipp *et al.* (2000), Katti *et al.* (1992), Lê Manh Hùng *et al.* (2002), Lekagul & Round (1991), Meyer de Schauensee (1984), Nguyễn Đức Tú *et al.* (2001), Oates (1883), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Singh (1995), Smith *et al.* (1940, 1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914, 1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thompson & Johnson (2003), Ticehurst (1933), Tizard *et al.* (1997), Wu Zhikang *et al.* (1986).

### 25. Chestnut-collared Yuhina

#### *Staphida torqueola*

**French:** Yuhina à bandeau

**German:** Kastanienohryuhina

**Spanish:** Yuhina Indochina

**Other common names:** Collared/Indochinese Yuhina

**Taxonomy.** *Siva torqueola* Swinhoe, 1870, Tingchow Mountains, Fujian, China.

Usually placed in genus *Yuhina*. Formerly treated as conspecific with *S. castaniceps* and, normally, *S. everetti*. Monotypic.

**Distribution.** S & SE China (SC Sichuan and E Yunnan E to W Hubei and Zhejiang, S to S Guangxi and Hong Kong), N Thailand, Laos and Vietnam (Tonkin, N & C Annam).



**Descriptive notes.** 14–15 cm; 12–16 g. Crown is dark grey with slightly paler fringes, sharply demarcated from chestnut-rufous hindcrown and nape with narrow long white streaks; mantle rufous-olive, shading to olive-brown on remaining upperparts, with narrow long whitish streaks on mantle to upper back; upperwing and tail grey-brown, tail with broad white tips on outer feathers; lores grey, narrow postocular stripe whitish, submoustachial area slightly glossy chestnut with white dots, cheek and ear-coverts the same and with white shaft streaks; chin, malar area, throat, breast and central belly whitish, breast side and flanks unevenly

marked with vague greyish-buff, thighs greyish-buff; iris reddish-brown to dull crimson or dark red; bill dark pinkish-brown; legs pinkish-brown. Differs from similar *S. castaniceps* (of race *striata*) in being slightly larger and larger-billed, with richer rufous-chestnut ear-coverts with bold white streaks extending around nape in broad chestnut-rufous collar, broader and pale greyish postocular supercilium with prominent white shaft streaks (forming restricted whitish eyebrow), warmer brown upperpart, cleaner and whiter underparts. Sexes similar. Juvenile is very like adult, but has upperparts tinged brown, edges of secondaries and wing-coverts browner. Voice. Song a loud "tu-whi" or "t-whi" (second part rising). Calls include continuous loud chattering and high squeaks by flock-members, also short dry trills and nasal notes, all similar to calls of *S. castaniceps*.

**Habitat.** Scrub and undergrowth in broadleaf forest, shrubby undergrowth in secondary forest, lower canopy and tall undergrowth; usually at 350–2200 m, mainly above 900 m.

**Food and Feeding.** Mainly insects, also seeds; visits various tree blossoms for nectar; often visits aphid-infested trees. Found in pairs during breeding season; otherwise in parties of up to 20–30 individuals, usually in single-species flocks, but often associates with other species. Flocks move very quickly and noisily in sweeping and swerving movements through trees. Forages in higher bushes and lower trees, searching among moss, lichen and loose bark on branches.

**Breeding.** Apr–Jul in China, Feb–Mar in Thailand and May–Jun in Vietnam; double-brooded. Partly a social breeder. Nest a compact cup built mostly by female, but 3–4 birds building single nest in Vietnam, made of moss and leaf skeletons, lined with palm fibre, rootlets and hair, based on coarser material and placed in hole in bank under shade of projecting ledge. Clutch 3–5 eggs (captive female repeatedly laid clutches of 5 eggs), white or with faint bluish or greenish tinge, dotted and speckled with various shades of brown, dark grey and black, and some light and dark grey spots; in captivity, incubation by both of pair, from last egg; incubation period 12 days, nestling period 10–11 days.

**Movements.** Chiefly resident. In S China, noted as irruptive, being common and widespread in some years and absent in others, e.g. in winter in Hong Kong, typically Nov–Mar.

**Status and Conservation.** Not assessed. Fairly common and widespread in S China, where judged the commonest yuhina and recently recorded at 29 (54%) of 54 sites surveyed (of which 52 are protected areas), including Shiwandashan National Nature Reserve, where common; irruptive winter visitor in Hong Kong, with small resident population of captive origin. In Laos, common in Nakai-Nam Theun National Biodiversity Conservation Area (NBCA) and present in Hin Namno, Nam Kading and Phou Khao Khoay NBCAs and in proposed extension to Nakai-Nam Theun NBCA. Present in Ba Be National Park and Na Hang Nature Reserve and common at Tam Dao National Park, in N Vietnam, and present in three protected areas in Annamese Lowlands Endemic Bird Area.

**Bibliography.** Bosche (2006), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Collar (2006), David-Beaulieu (1939, 1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Eames *et al.* (2001), Hill (2000), King & Han Lianshan (1991), King & Zheng Guangmei (1988), La Touche (1925–1930), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Liu Kezhi *et al.* (1994), Lülfing (1984), Meyer de Schauensee (1984), Pfeiffer (1993), Robbins *et al.* (2006), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstenecroft *et al.* (1989), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounholine (1998), Stevens (1914, 1923), Tedbury (1995), Viney *et al.* (1994), Wu Zhikang *et al.* (1986), Yen Kwok-ung (1934a).

### 26. Chestnut-crested Yuhina

#### *Staphida everetti*

**French:** Yuhina de Bornéo

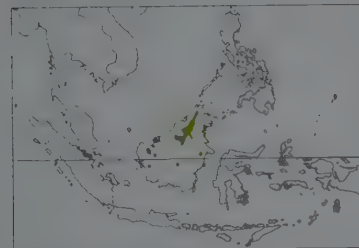
**German:** Rotschopfyuhina

**Spanish:** Yuhina de Borneo



**Taxonomy.** *Staphidia* [sic] *everetti* Sharpe, 1887, Kinabalu, north Borneo. Usually placed in genus *Yuhina*, and sometimes in *Minla*. In past, normally treated as conspecific with *S. castaneiceps* and *S. torquata*. Monotypic.

**Distribution.** Borneo.



**Descriptive notes.** 14–15 cm. Crown and nape are rufous-tan with very slightly paler fringes, cutting sharply to dull olive-grey upperparts and darkish grey-brown upperwing and tail, tail with broad white tips on outer feathers; lores and narrow short supercilium white, ear-coverts as crown, submoustachial area white, very narrow indistinct malar line rusty-tan; chin to vent whitish, with dull greyish thighs; iris chocolate-brown or very dark or dull brown to chestnut; bill dark grey or dark brown to blackish; legs light brown or greyish-brown to brownish-flesh. Distinguished from very similar *S. castaneiceps* (nominat race) by larger

size, plainer and more rufous crown and ear-coverts, lacking buffy-grey frontal scaling, whiter and more contrasting lores and supercilium, a shade darker upperparts virtually lacking pale streaks. Sexes similar. Juvenile is presumably very similar to adult. **VOICE.** Song apparently unreported. Contact calls are combinations of low quick “whit”, “chik” and “yik” notes; alarm call a harsh rattling “chr-r-r-r-r-r”, “chrr-r-r” and “yrr-r-r-r”; chicks produce hurried chatter when excited, before and during flight.

**Habitat.** Generally submontane and montane broadleaf evergreen forest, moss forest, also kerangas, forest edge and secondary growth, at 100–2800 m.

**Food and Feeding.** Insects such as moths (Lepidoptera); also seeds, berries and fruit, including those of *Bridelia*, *Glochidion*, *Macaranga*, *Mallotus javanicus* and *Mallotus macrostachyus*, *Trema*, soft white berries of *Pipturus* and small purple figs, also nectar of *Eugenia*; grass seeds taken in drought conditions. Found in fast-moving noisy flocks of 6–12 or up to 20 or more individuals; sometimes joins mixed foraging flocks, but often monospecific groups of this species attract other birds owing to insects flushed by their rapid passage. Seen to enter cavities in moss, apparently in pursuit of invertebrates.

**Breeding.** Nov–Aug in N (Sabah). Nest with four young seen attended by at least four adults, suggesting co-operative breeding. Nest a cup of moss, roots, fibres and grasses, lined with rootlets, fine fibres, dried grass fibres and bits of bark, placed 0.5–0.6 m above ground in often moss-covered recess in trailside bank, riverbank or other suitable place. Clutch 1–6 eggs, usually 3, white or pinkish-white, spotted and/or streaked with mid-brown or dark reddish-brown to red-purple. No information on incubation and nesting periods. Nests parasitized by cuckoos (Cuculidae), and this species seen to mob Moustached Hawk-cuckoo (*Cuculus vagans*).

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Bornean Mountains EBA. Fairly common to common throughout range. Common in Sabah; in some places (e.g. Mt Kinabalu) the commonest flocking bird in area; present in Kutai and Kayan Mentarang National Parks, in E Kalimantan, and in Gunung Palung National Park and Gunung Niut Nature Reserve (very common above 500 m), in W Kalimantan.

**Bibliography.** Collar (2006), Davison (1992), Duckworth & Kelsch (1988), Eames (2005), Finsch (1905), Fogden (1964), Holmes (1997), Priemé & Heegaard (1988), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield *et al.* (1998), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## Genus *DASYCROTAPHA* Tweeddale, 1878

### 27. Flame-templed Babbler

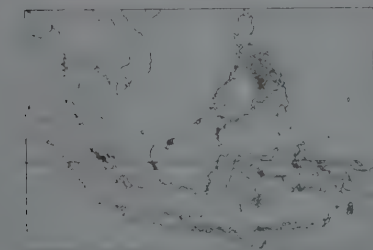
#### *Dasycrotapha speciosa*

**French:** Timalie précieuse **German:** Goldstirn-Buschtimalie **Spanish:** Timali Frentigualdo  
**Other common names:** Orange-templed/Rough-templed Babbler, Beautiful Rough-templed, Rusty-crowned Babbler

**Taxonomy.** *Dasycrotapha speciosa* Tweeddale, 1878, Valencia, Negros, Philippines.

Commonly placed in genus *Stachyris*. The populations on the two islands are reported to differ from one another sufficiently to warrant recognition of two races; further investigation required. Monotypic.

**Distribution.** Panay and Negros, in WC Philippine Is.



**Descriptive notes.** 13 cm. Remarkable small babbler, greyish-green with complex head pattern of yellow, orange, black and white. Brightly lores and forehead are yellow, centre of crown black, bright orange supercilium tufts above eye, hindcrown pale olive-yellow, black half-collar on hindneck adjoining black ear-coverts, latter with long white shaft streaks; black cheek and central submoustachial area, yellow interramal area, upper submoustachial tufts and chin; upperparts olive-grey with long whitish shaft streaks, rump olive-green, upperwing and tail olive-brown with olive-yellow fringes; throat to breast yellow with

large black spots, shading to olive-yellow on flanks, belly and vent; iris red-brown, yellow orbital skin, some exposed pale blue-grey skin behind eye, bill pale orange, legs olive. Sexes similar. Juvenile is like adult. **VOICE.** Song pleasant and musical, of 7–10 quickly delivered, rather slurred sweet notes, starting faintly, but gathering in volume, “iwi-iwi-wi-wi-yi-wee-wee” or “i-wi-ti-chi-wi-wi-wi”, lasting 2–2.5 seconds, repeated every 6–10 seconds; starts high-pitched, then becomes more spaced and fluty, similar to speeded-up song of *Mesia argentea*. Contact calls are soft “yir”, “ju”, “chu” and “ju-jrrr”.

**Habitat.** Thick undergrowth and understorey in primary forest, secondary forest and degraded secondary forest, also forest edge, at 75–1180 m. Requirements not well understood, although

perhaps a forest-edge specialist, absent from some tracts of apparently suitable degraded and secondary forest.

**Food and Feeding.** Insects, including large ones, reported. Forages unobtrusively in undergrowth close to ground and in understorey bushes and in middle-storey trees up to 10 m, also in dense tangles of vines and ferns on larger trees. Often feeds in slow, methodical fashion among trapped bunches of leaves, but may move very quickly through undergrowth. Found singly or in small parties of up to three or more individuals, often associating in mixed flocks with other species, e.g. fantails (*Rhipidura*), leaf-warblers (*Phylloscopus*) and tailorbirds (*Orthotomus*).

**Breeding.** Season on Negros apparently extended: breeding-condition birds in Feb, Apr, May, Aug and Dec, territorial behaviour in late Mar and early Apr, and juvenile and birds with brood patches in Aug. No further information.

**Movements.** Resident.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in Negros and Panay EBA. Known from five localities on Panay (all found since 1980) and from 18 on Negros (five with post-1980 records). Formerly judged fairly common and widespread, but now generally uncommon and declining, the species evidently disappearing from many lower-lying areas on Negros owing to deforestation. On Panay very uncommon and/or very patchy, and most of the island is apparently unsuitable. On Mt Canlaon, on Negros, fieldwork in 1991 yielded a very approximate density of 0.22 birds/ha, but area of forest very limited. Continuing forest destruction a major problem, even second growth being cleared so rapidly that fears for the species’ survival were expressed in early 1990s. Present in Mount Canlaon National Park and North Negros Forest Reserve.

**Bibliography.** Anon. (2006d), Brooks *et al.* (1992), Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Dickinson *et al.* (1991), Evans, Dutton & Brooks (1993), Hachisuka (1935), Kennedy *et al.* (2000), Lambert (1993), Mallari *et al.* (2001), McGregor (1909), duPont (1971), Rand (1951), Ripley & Rabor (1956), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## Genus *STERRHOPTILUS* Oberholser, 1918

### 28. Mindanao Pygmy Babbler

#### *Sterrhoptilus plateni*

**French:** Timalie pygmée **German:** Zwergbuschtimalie **Spanish:** Timali de Mindanao  
**Other common names:** Platen’s Babbler, Pygmy Tree-babbler

**Taxonomy.** *Mixornis Plateni* A. W. H. Blasius, 1890, Mindanao, Philippines.

Genus usually merged into *Stachyris*. Until recently considered conspecific with *S. pygmaeus*. Monotypic.

**Distribution.** Mindanao, in S Philippines.



**Descriptive notes.** 10 cm; 7.5–10 g. Tiny babbler, mid-brown above and greyish-whitish below, with striking white-streaked dark head, throat and breast. Forehead is almost black, crown and ear-coverts dull chestnut, all with bold white shaft streaks; upperparts rust-tinged brown with obscure pale shaft streaks, upperwing and tail mid-brown; chin, throat and upper breast rich chestnut-brown with bold clean white shaft streaks, heaviest on chin; lower breast to undertail-coverts pale grey, flanks rusty buff; iris whitish or very pale grey; bill slate-blue; legs blackish. Sexes similar. Juvenile apparently undescribed. **VOICE.** Calls include quiet

“ichik”, “chik” or “chit” notes, sometimes repeated as series in quick succession, “chik-chik-chik-chik-chik” or “chidididit”; a quiet “dzhou dzhou dzhou” and “tsieu tsieu...tsieu tsieu tsieu”.

**Habitat.** Primary and secondary forest, forest edge and second growth, low fruiting trees in abandoned cultivation, and occasionally fruiting trees in cultivated areas near forest; at 100–1100 m.

**Food and Feeding.** Insects, some small fruits. Found in pairs or small parties, often in company with other species, including other babblers, in mixed flocks. More active and mobile than other members of genus. Forages in middle storey 3–6 m up, occasionally ascending to 12 m in lower canopy. Sometimes hangs upside-down when feeding; occasionally sallies for insects.

**Breeding.** Birds in breeding condition in Mar–May. Nest materials include white fluffy (seed) matter. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *S. pygmaeus*, considered Near-threatened. Restricted-range species: present in Mindanao EBA. Apparently uncommon to rare throughout range, as forest at lower elevations being extensively destroyed. Recorded from some sites (Apo, Kitanglad) which are now established as national parks, but not known if current extent of forest there secures any population.

**Bibliography.** Blasius (1890b), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Delacour & Mayr (1945, 1946), Dickinson *et al.* (1991), Hachisuka (1935, 1936), Ilomskov (1996), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1897), duPont (1971), Rand & Rabor (1960), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

### 29. Visayan Pygmy Babbler

#### *Sterrhoptilus pygmaeus*

**French:** Timalie de Samar **German:** Koboldbuschtimalie **Spanish:** Timali Pigmeo

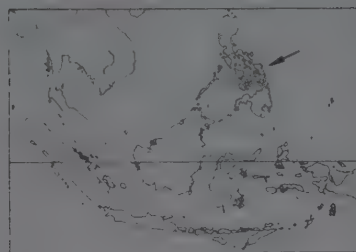
**Taxonomy.** *Zosterornis pygmaeus* Ogilvie-Grant, 1896, Samar, Philippines.

Genus usually merged into *Stachyris*. Until recently treated as subspecies of *S. plateni*. Monotypic.

**Distribution.** Samar and Leyte, in EC Philippines.

**Descriptive notes.** 10 cm. Plumage is dull olive-brown above, slightly warmer on crown, lores darker brown than crown and this colour riding over eye in vague supercilium; mid-grey to greyish-olive from chin to breast and flanks, with diffuse white streaks along shafts making soft pattern spreading out from chin, flanks greyish-white; iris has outer ring vermilion or red, inner ring pale yellow, bill slate-blue; legs slate-grey. In addition to details of coloration, differs markedly from





*S. plateni* in having shorter bill, wing and, especially, tail. Sexes similar. Juvenile apparently undescribed. Voice. Presumably similar to that of *S. plateni*.

**Habitat.** Primary and secondary forest, forest edge and second growth, at 100–1100 m.

**Food and Feeding.** Insects, some fruits. Found in pairs or small parties, often in mixed flocks with other species, including other babblers. Forages in middle storey, occasionally ascending to lower canopy. Sometimes hangs upside-down when foraging; will sally for insects.

**Breeding.** Birds in breeding condition in Apr and May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *S. plateni*, considered Near-threatened. Restricted-range species: present in Eastern Visayas EBA. Not well known. Apparently uncommon to rare throughout range, as forest at lower edges being extensively destroyed.

**Bibliography.** Bourns & Worcester (1894), Collar (2006), Delacour & Mayr (1945, 1946), Hachisuka (1935), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1896b, 1897), Whitehead (1899).

### 30. Golden-crowned Babbler

#### *Sterrhoptilus dennistouni*

**French:** Timalie à calotte dorée

**Spanish:** Timali Coronadoro

**German:** Goldkappen-Buschtimalie

**Other common names:** Golden-crowned Tree-babbler

**Taxonomy.** *Zosterornis dennistouni* Ogilvie-Grant, 1895, Cape Engaño, north-eastern Luzon, Philippines.

Genus usually merged into *Stachyris*. May form a superspecies with *S. nigrocapitatus* and *S. capitalis*, and all three have been treated as conspecific. Monotypic.

**Distribution.** Luzon (Northern Sierra Madre Mts; one record Ilocos Norte), in N Philippines.



**Descriptive notes.** 13–14 cm. Distinctive small, slightly crested babbler, grey-olive above and pale yellow-buff below, with strong yellow crown and throat and contrasting black bill. Forehead and crown are bright yellow (crown feathers slightly elongate and stiffly filamentous), shading to greyish-olive with yellow shaft-streaks on hindcrown, nape and neck side, and to duller brown-tinged grey-green upperparts with whitish shaft streaks; upperwing and tail dull brown, wing feathers with pale buffy-grey fringes, tail with white-tipped outer feathers and white outer web of outermost rectrix; submoustachial area, cheek

and ear-coverts pale olive-grey with yellowish-white shaft streaks; throat yellow, breast and belly yellowish-white, flanks and thighs grey-tinged; iris deep red to red-brown; bill black; legs olive-brown to greyish-blue. Sexes similar. Juvenile is like adult. Voice. Noisy, fast series of 3–5 notes, “pilit-pilit-pilit”, followed by 5–7 slower pulsing notes, “poo poo poo poo poo”; “wit-wit-wit-wi-wi-wi-wu”, ending higher and more sibilant; “wi-wi-wi-wi-pr-pr-pr”, starting high and ending more slurred; and “wi-wi-wi-wi-pr-pr-piu-piu-piu”; also a quiet “wit-wit”, “pi” and “pri-pri-pri”, “prie-prie-prie”, etc.

**Habitat.** Primary forest, selectively logged and degraded forest and forest edge, bamboo, and adjacent tall-grass areas; prefers forest with more than 90% canopy cover but with very dense understorey covering 60–90% of floor (0–3 m), with young trees, rattans, bamboo, ferns and creepers. Sea-level to 1150 m.

**Food and Feeding.** Presumably invertebrates. Found singly, in pairs or in small parties of up to four individuals, often in association with other species. Forages 1–15 m above ground, usually at c. 5 m. Observed to use foliage-gleaning.

**Breeding.** Birds in breeding condition in Apr, nest found in May, and nestlings and fledglings in May and Jul. One nest a cup of woven mosses, hair-like roots and small twigs, suspended between several branches of bush 1 m from ground; contained two nestlings. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Luzon EBA. Locally fairly common to common, e.g. common at Dimapnat, and fairly common at Palanan, Dagupan, Abuan and Minuma. Potentially at risk from deforestation within its small range. Present in Northern Sierra Madre Natural Park.

**Bibliography.** Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (1991), Hachisuka (1935, 1936), Hornsby (1996), Kennedy *et al.* (2000), McGregor (1909), DuPont (1971), Poulsen (1995), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Whitehead (1899).

### 31. Black-crowned Babbler

#### *Sterrhoptilus nigrocapitatus*

**French:** Timalie à calotte noire

**Spanish:** Timali Coroninegro

**German:** Schwarzkappen-Buschtimalie

**Other common names:** Black-crowned Tree-babbler

**Taxonomy.** *Mixornis nigrocapitatus* Steere, 1890, Samar and Leyte, Philippines.

Genus usually merged into *Stachyris*. May form a superspecies with *S. dennistouni* and *S. capitalis*, and all three have been treated as conspecific. Three subspecies recognized.

**Subspecies and Distribution.**

*S. n. affinis* (McGregor, 1907) – S & SE Luzon, in N Philippines.

*S. n. nigrocapitatus* (Steere, 1890) – Samar and Leyte, in EC Philippines.

*S. n. philippinus* (Rand & Rabor, 1957) – Bohol, in SC Philippines.

**Descriptive notes.** 13–14 cm. Small dusky babbler, grey-brown above and whitish below, with strongly rufous blackish crown, rusty malar and yellowish throat. Nominative race has forehead and crown black (crown feathers slightly elongate and spiky), hindcrown and rear super-



cilium tinted greyish-chestnut, nape greyish-ochre, shading on upperparts to dark dull greyish-olive with whitish shaft streaks; upperwing and tail dull dark brown, tail with white-tipped outer feathers and white outer vane of outermost rectrix; lores greyish, submoustachial area, cheek and ear-coverts greyish with fine whitish shaft streaks, short malar dull rusty-chestnut; chin and throat yellow with vague narrow rusty lines, breast and belly pale grey with yellowish wash, breast side and flanks greyish; iris red-brown, outer ring red and inner ring pale yellow; bill black; legs olive-brown to dull lead-blue. Sexes similar. Juve-

nile has crown brownish and scapulars darker, both with whitish shaft streaks, chin and throat paler, outer webs of primaries pale sandy. Race *affinis* has upperparts more olive than nominate, throat rusty with yellow wash, underparts heavily washed olive-yellow; *hoholensis* has reduced rusty malar, unstreaked yellow throat, less greyish-chestnut on nape and behind eye. Voice. Song appears to be a short series of “whit” notes running into a level or descending series of “du” or “diti” notes; transcribed also as “wi-wi-wi-wi-wi-wi”, “wi-wi-wi-wi-wi-wi-wi” and “wit-wit-wit-wit-wi-wi-whoi-whoi”. Contact call a series of quiet “whit” or “whut” notes, or “wuc-wuc”.

**Habitat.** Inhabits undergrowth in primary evergreen forest, thick forest, and forest edge, at 100–1140 m.

**Food and Feeding.** No documented records of food; presumably small invertebrates and some vegetable matter. Found singly, in pairs or in small parties, often in association with other species, including other babblers, in mixed flocks. Forages in lower branches of trees, sometimes in canopy, 6–9 m above ground. A fairly slow and methodical feeder. Hunts by foliage-gleaning and by disturbing insects around dead leaves trapped in canopy of small trees. Sometimes hangs upside-down when feeding.

**Breeding.** Birds in breeding condition in Apr and May, nest-building in Apr, and nestlings in May and Jul. Nest, built by both sexes, a deep cup or cradle made of moss, fine black fibres and other plant fibres, sometimes a little white cotton-like material, lined with fine fern roots, suspended 1.2–1.25 m above ground between small twigs of bush or sapling. Clutch 3 eggs, pale greenish-blue. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare on Bataan Peninsula, on Luzon. Fairly common in Rajah Sikatuna National Park, on Bohol.

**Bibliography.** Brooks *et al.* (1996), Delacour & Mayr (1946), Dickinson *et al.* (1991), Gilliard (1950), Goodman & Gonzales (1990), Hachisuka (1935, 1936), Hornsby (1996), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1897), DuPont (1971), Rand & Rabor (1957, 1960), Whitehead (1899).

### 32. Rusty-crowned Babbler

#### *Sterrhoptilus capitalis*

**French:** Timalie mitrée

**German:** Gelbkehl-Buschtimalie

**Spanish:** Timali Mitrado

**Other common names:** Rusty-crowned Tree-babbler, Rufous-crowned Babbler(1)

**Taxonomy.** *Mixornis* (?) *capitalis* Tweeddale, 1877, Dinagat, Philippines.

Genus usually merged into *Stachyris*. May form a superspecies with *S. dennistouni* and *S. nigrocapitatus*, and all three have been treated as conspecific. Three subspecies recognized.

**Subspecies and Distribution.**

*S. c. capitalis* (Tweeddale, 1877) – Dinagat, in EC Philippines.

*S. c. euroaustalis* (Parkes, 1988) – Mindanao (excluding Zamboanga Peninsula), in S Philippines.

*S. c. isabellae* (Parkes, 1963) – W Mindanao (Zamboanga Peninsula) and Basilan, in S Philippines.



**Descriptive notes.** 14–15 cm; 14–19 g. Distinctive smallish babbler, with bold whitish streaks on head and upperparts, rusty crown and throat, and whitish underside. Nominative race has forehead and forecrown rusty-chestnut (crown feathers spiky and elongate, extending over crown), rest of crown, also head side (submoustachial area, cheek, ear-coverts), neck side, upperparts and upperwing-coverts dark olive-grey with bold whitish shaft streaks; flight-feathers darkish brown with whitish fringes, tail darkish brown with white-tipped outer feathers and white outer web of outermost rectrix; lores greyish with buffy-white

stippling, chin, throat and breast yellow with strong, uneven rusty suffusion, shading to pale yellow lower underparts, with greyish wash on flanks; iris red-brown or red with chestnut tinge; bill black; legs olive-brown to dull pale bluish-grey. Sexes similar. Juvenile is like adult. Race *isabellae* has more prominent shaft streaks on crown and back, upperparts slightly duller than nominate; *euroaustalis* has breast heavily suffused grey, sides and flanks extensively grey, vent mainly grey, crown more orange-brown. Voice. Song unrecorded, but probably very like that of *S. nigrocapitatus*. Call usually soft and bubbling, but may be fairly loud “whit” or “wyit”; may be repeated several times when alarmed, as “whit whit chew-chew-chew” in variable numbers of notes, one or more birds participating.

**Habitat.** Middle and lower storeys (occasionally lower canopy) of primary and logged forest, and forest edge; from lowlands to 1100 m.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Found singly, in pairs or in small parties, often in association with other species in mixed feeding flocks. Forages 1–2–12 m above ground, by foliage-gleaning, sometimes hanging upside-down to do so; seen to probe small wasp nests cemented to underside of leaves; occasionally sits motionless.

**Breeding.** Birds in breeding condition in Mar and Jun, and immatures in Feb, May and Aug. No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Formerly considered Near-threatened. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Generally uncommon.

**Bibliography.** Delacour & Mayr (1946), Dickinson *et al.* (1991), Hachisuka (1935, 1936), Kennedy *et al.* (2000), McGregor (1909), Parkes (1988), DuPont (1971), Rand & Rabor (1960), Stattersfield *et al.* (1998).





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PLATE 4



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## Genus *ZOSTERORNIS* Ogilvie-Grant, 1894

### 33. Chestnut-faced Babbler

#### *Zosterornis whiteheadi*

**French:** Timalie de Whitehead **German:** Brillenstreifentimalie **Spanish:** Timalí de Whitehead  
**Other common names:** Whitehead's Babbler/Tree-babbler

**Taxonomy.** *Zosterornis whiteheadi* Ogilvie-Grant, 1894, mountains of northern Luzon, Philippines.

Genus usually merged into *Stachyris*. Two subspecies recognized.

#### **Subspecies and Distribution.**

*Z. w. whiteheadi* Ogilvie-Grant, 1894 – N & C Luzon, in N Philippines.

*Z. w. sorsogonensis* (Rand & Rabor, 1967) – SE Luzon.



**Descriptive notes.** 15 cm; 17–27 g. Olive-green babbler, yellowish below, with dull grey crown and dull chestnut face. Nominant race has forehead, lores, narrow supercilium (to just behind eye), ear-coverts, cheek, submoustachial area, malar and chin dull rusty chestnut, thin darker eyebrow line inside supercilium; forehead whitish and grey, shading to dull medium grey on mid-crown to hindneck and to olive-green on upperparts; upperwing and tail greyish-brown with olive-green fringing; mid-throat and belly to vent yellow, breast and flanks tinged olive; iris brown to dark brown, white eyering broken at front; bill black; legs

olive or olive-green. Sexes similar. Juvenile apparently undescribed. Race *sorsogonensis* has crown, supercilium and ear-coverts edged with black. Voice. Call/song a loud, rapid, busy twittering of snappy sharp metallic notes, usually in long series and used as contact call by flock-members, “chip chip chip chip”, 4–5 per second, interspersed with 4–6 alternating “pe-chu pe-chu pe-chu pe-chu”, many birds calling simultaneously.

**Habitat.** Montane mossy forest, broadleaf evergreen forest, pine forest, open forest, secondary growth, scrub, tangled masses of high grass and small trees on mountainsides. Usually above 800 m (mainly above 1000 m), occasionally down to 100 m, and extending to 2600 m; abundant above 1400 m.

**Food and Feeding.** Seeds, fruit, small beetles (Coleoptera) and spiders (Araneae). Found singly, in pairs or in parties of up to 30 individuals, often in association with other species in mixed flocks. Usually feeds in middle to lower levels of vegetation but frequently ascends to canopy. Drinks water held in pitcher-plants.

**Breeding.** Birds in breeding condition in Apr–Jun. No other information.

**Movements.** Resident; records from Dalton Pass (migration bottleneck in C Luzon) suggest that some type of local displacement may occur, improbable as this seems.

**Status and Conservation.** Not globally threatened. Formerly considered Near-threatened. Restricted-range species: present in Luzon EBA. Common in Sierra Madre above 800 m, and abundant in mossy forests throughout range. Apparently able to survive in secondary growth and scrub. Present in areas under varying types of protection, notably Northern Sierra Madre National Park and Mount Isarog National Park.

**Bibliography.** Alonzo-Pascolan (1992), Dickinson *et al.* (1991), Goodman & Gonzales (1990), Hachisuka (1935), Kennedy *et al.* (2000), McGregor (1909), Morioka & Sakane (1979), DuPont (1971), Poulsen (1995), Rand & Rabor (1967), Stattersfield *et al.* (1998), Whitehead (1899).

### 34. Luzon Striped Babbler

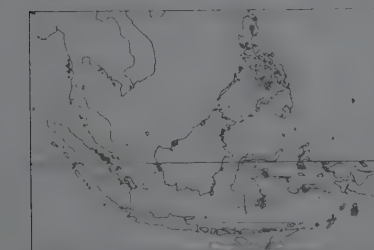
#### *Zosterornis striatus*

**French:** Timalie striée **German:** Luzonstreifentimalie **Spanish:** Timalí Estriado  
**Other common names:** Striped Tree-babbler

**Taxonomy.** *Zosterornis striatus* Ogilvie-Grant, 1894, Isabela Province, Luzon, Philippines.

Genus usually merged into *Stachyris*. May form a superspecies with *Z. latistriatus*, *Z. nigrorum* and *Z. hypogrammicus*; has been thought possibly conspecific with first of those. Monotypic.

**Distribution.** Luzon (Northern Sierra Madre Mts and Bataan Peninsula), in N Philippine Is.



**Descriptive notes.** 13–14 cm. Smallest babbler, olive-green above and creamy yellow with extensive heavy blackish streaking below. Crown to rump are greyish olive-brown, former with vague darker grey streaks; upperwing and tail grey-brown, primaries with dull olive-yellow fringing; lores and frontal cheek buffy whitish, preocular supercilium and subocular ring blackish, rear cheek and ear-coverts pale greenish-grey, submoustachial area blackish with buff flecks; chin and upper throat creamy buff, becoming yellow-tinged from breast to belly and greyer on flanks, with blackish streaks beginning small and narrow

on lower throat but becoming long and broad on underparts; iris pale brown to mid-brown, white eyering broken before eye; bill black; legs dull olive to brownish-green or brownish-flesh. Sexes similar. Juvenile is like adult. Voice. Song, from treetops up to 15 m or so above ground, a high-pitched rapid series of “tsi” notes, accelerating to short trill but slowing with final “zeep zeep”

notes, lasting c. 2–5 seconds and repeated every c. 2–8 seconds, reminiscent of song of white-eye (*Zosterops*). Calls include high “tsi” note, sometimes reminiscent of a very loud Goldcrest (*Regulus regulus*), also ■ sharp metallic staccato trill, “tiptiptiptiptip...”, repeated every 5–6 seconds; others transcribed as “swip-swip”, “twip”, a rather metallic “tswip-tip” and “twip-twip”, sometimes combined into a kind of sub-song.

**Habitat.** Primary, secondary, selectively logged and degraded forest, bamboo forest, second growth, forest edge, and overgrown clearings, at 115–1000 m.

**Food and Feeding.** Berries, small fruits and insects. Found singly, in pairs or in small parties, often in association with other species, notably *Sterrhophilus dennisi*, in mixed flocks. Usually forages in middle and upper storeys but also down to upper lower storey, 1–2–6 m above ground; often in denser bushy parts of smaller trees. Hunts rather slowly and methodically around leaves.

**Breeding.** Two birds feeding intermittently on berries in early May were suspected to be feeding nestlings. No other information.

**Movements.** Resident, suggestion of some regional or elevational movement (common at site in Aurora in Feb, unrecorded at same locality in May), but this requires fuller investigation.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Luzon EBA. Although once judged rare and local, and formerly considered Vulnerable, now known to be common locally. Capable of persisting in heavily degraded forest and overgrown clearings; even so, actual and potential habitat loss within range is substantial. Present in Northern Sierra Madre National Park.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (1991), Gonzales & Kennedy (1990), Hachisuka (1935), Kennedy *et al.* (2000), McGregor (1909), Parkes (1971), DuPont (1971), Poulsen (1995), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Whitehead (1899).

### 35. Panay Striped Babbler

#### *Zosterornis latistriatus*

**French:** Timalie à raies larges **German:** Panaystreifentimalie **Spanish:** Timalí Rayado

**Taxonomy.** *Stachyris latistriata* Gonzales and Kennedy, 1990, 1–1 km SSW of peak of Mount Baloy, Barangay San Agustín, Municipality of Valderrama, Antique Province, Panay, Philippines. Genus usually merged into *Stachyris*. May form ■ superspecies with *Z. striatus*, *Z. nigrorum* and *Z. hypogrammicus*; arguably conspecific with *Z. nigrorum*, but vocally distinct; has also been considered possibly conspecific with *Z. striatus*. Monotypic.

**Distribution.** W Panay (Mt Baloy and adjacent peaks), in WC Philippine Is.



**Descriptive notes.** 15 cm; 24–32 g. Olive-green babbler with extensively dark-streaked creamy-yellow underside and creamy-white face. Blackish forehead shades to blackish-scaled dull olive-green on crown and neck side, upperparts dull olive-green; upperwing and tail greyish olive-brown, primaries with dull olive-yellow fringes, tail with vague rusty tinge; lores, supercilium, cheek, ear-coverts and submoustachial area creamy white, narrow dark eyestripe, moustachial line and malar line, last two meeting and curving up to form dark edge to rear ear-coverts; chin and upper throat cream-white, lower throat pale sulphur-yellow.

becoming buff-yellow on breast and belly, flanks greenish-olive, broad black streaks (varying in intensity) beginning on throat, most prominent on breast, fading to dark olive-green on belly and undertail-coverts; iris bright rusty, outer edge paler, creamy eyering; upper mandible dark horn, lower mandible dark horn at tip and paler towards cutting edge; legs bluish-olive. Sexes similar. Juvenile is less boldly streaked than adult. Voice. Song/call a series of 11–17 slightly ascending staccato trills, “chi chi-chi-chi-chi”, each 1–2 seconds long, repeated about ten times a minute for up to 2–5 minutes, with some sharp “tsik” notes and occasional chatter interspersed. Similar to that of *Z. striatus*.

**Habitat.** Mainly middle and upper storeys of montane evergreen forest, mossy forest, but all strata used; 1000–1900 m, mostly above 1400 m.

**Food and Feeding.** Insects, including beetles (Coleoptera) and cicadas (Cicadidae); also seeds. Found singly or in pairs, sometimes in small groups of three or more (breeding season). Forages mainly 3–12 m above ground, occasionally lower.

**Breeding.** Nest found in Oct and birds in breeding condition in Apr. One nest a cup made of live and dead mosses loosely woven together, lined with black hair-like roots of epiphytic ferns and larger stems from orchids, suspended c. 5 m above ground among small branches in centre of crown of small tree. Clutch 2 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Negros and Panay EBA. Common, and on Mt Baloy the most abundant bird species. Much suitable habitat remains on slopes steeper than 45 degrees, and this species is therefore likely to be relatively secure, but it has a tiny global range. Formerly considered Vulnerable.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (1991), Gonzales & Kennedy (1990), Kennedy *et al.* (2000), Ruthven (1990), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

### 36. Negros Striped Babbler

#### *Zosterornis nigrorum*

**French:** Timalie de Negros **German:** Negrosstreifentimalie **Spanish:** Timalí de la Negros  
**Other common names:** Negros Tree-babbler

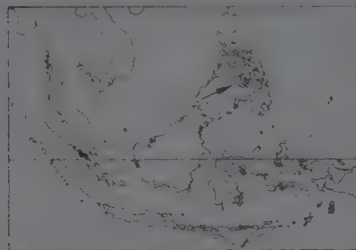
**Taxonomy.** *Stachyris nigrorum* Rand and Rabor, 1952, Cuernos de Negros, Negros Oriental Province, Negros, Philippines.

On following pages: 37. Palawan Striped Babbler (*Zosterornis hypogrammicus*); 38. Grey-cheeked Fulvetta (*Alcippe morrisonia*); 39. Nepal Fulvetta (*Alcippe nipalensis*); 40. Mountain Fulvetta (*Alcippe peracensis*); 41. Black-browed Fulvetta (*Alcippe grotei*); 42. Brown-cheeked Fulvetta (*Alcippe poiocephala*); 43. Brown Fulvetta (*Alcippe brunneicauda*); 44. Javan Fulvetta (*Alcippe pyrrhoptera*); 45. Rufous-throated Fulvetta (*Schoeniparus rufogularis*); 46. Rusty-capped Fulvetta (*Schoeniparus dubius*); 47. Dusky Fulvetta (*Schoeniparus brunneus*); 48. Dark-fronted Babbler (*Rhopocichla atriceps*); 49. Tawny-bellied Babbler (*Dumetia hyperythra*).



Genus usually merged into *Stachyris*. May form a superspecies with *Z. striatus*, *Z. latistriatus* and *Z. hypogrammicus*; arguably conspecific with *Z. latistriatus*, but vocally distinct. Monotypic.

**Distribution.** Negros, in WC Philippine Is.



**Descriptive notes.** 14.5–15 cm. Forecrown and supercilium are black, rest of crown, neck side and upperparts olive; upperwing and tail dark greyish-brown, tertials and secondaries with whitish inner fringes (invisible on closed wing); lores whitish, cheek and frontal ear-coverts whitish with blackish flecks, rear ear-coverts olive with blackish flecks, submoustachial area white basally, black distally; chin and throat whitish, shading to yellowish on breast to belly, with narrow blackish shaft streaks on breast and broader, softer-edged, more greyish-olive streaks on belly and vent, olive-grey flanks and thighs; iris colour undocumented, believed dull reddish;

white orbital skin; bill black; legs dark grey. Differs from very similar *Z. latistriatus* in having black extending from forehead over eye, no obvious "tramlines" (moustachial and malar lines) in upper submoustachial area but lower submoustachial area black and pronounced, streaking below much thinner and olive-green, rather than blackish (also, tail reportedly more reddish, but this not apparent on skins). Sexes similar. Juvenile apparently unrecorded. **Voice.** Song a loud pure whistle (sometimes delivered as subdued version), "pli-hi pli-hi pli-hi" (or "pli-plie"), the first and third couplets rising and second and fourth falling, or "plea-he, plea-hü, plea-he, plea-hü"; a single burst also described as "tu-tu tutu soo". Contact call a soft continuous "tsip, tsip..." or short sharp "tzi", sometimes becoming a trill; also a high-pitched "weeet" and a double note.

**Habitat.** Montane forest, secondary and degraded forest, forest edge and adjacent banana plantations and dense bushes; at 900–1600 m, mainly above 1000 m.

**Food and Feeding.** Insects and small fruits. Found singly, in pairs or in small parties of up to c. 20 individuals; often in association with other species, including Philippine Bulbul (*Ixos philippinus*), Mountain White-eye (*Zosterops montanus*), Mountain Leaf-warbler (*Phylloscopus trivirgatus*), Blue-headed Fantail (*Rhipidura cyaniceps*) and Elegant Tit (*Periparus elegans*); a primary constituent of bird waves where common. Forages in foliage of understorey trees and bushes, occasionally ascending to c. 20 m in canopy (e.g. at sunset); once seen to feed among dead leaves hanging under head of banana plant.

**Breeding.** Female in breeding condition in Nov and birds with slightly enlarged gonads in Nov–Dec; dependent juvenile observed in Sept. No other information.

**Movements.** Resident.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in Negros and Panay EBA. Confined to island of Negros, where known from only four sites: three on and around Mt Talinis (Cuernos de Negros), in S, and one on Mt Canlaon (single record of single bird), in N. Record at latter site not repeated, despite much fieldwork, so area unlikely to be of great value to species; Mt Talinis therefore the crucial (and indeed only post-1980) site. On Mt Talinis was rather common above 1050 m in 1991, but numbers may fluctuate between sublocalities on the mountain; moreover, area under some pressure from illegal logging and slash-and-burn colonizers, despite being under control of Philippine National Oil Corporation, which operates a large geothermal powerplant on the mountain, and despite these forests being the sole watershed for the human population in S of island.

**Bibliography.** Anon. (2006d), Brooks *et al.* (1992), Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Dickinson *et al.* (1991), Evans, Dutton & Brooks (1993), Gonzales & Kennedy (1990), Hornskov (1996), Kennedy *et al.* (2000), Mallari *et al.* (2001), DuPont (1971), Rand & Rabot (1952), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 37. Palawan Striped Babbler

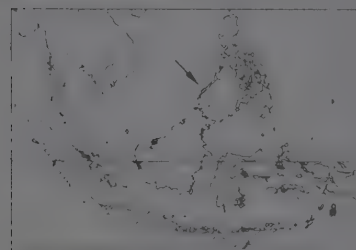
### *Zosterornis hypogrammicus*

**French:** Timalie de Palawan **German:** Palawanstreifenfimalie **Spanish:** Timali de Palawan  
**Other common names:** Palawan Tree-babbler, Buff-capped Babbler

**Taxonomy.** *Stachyris hypogrammica* Salomonsen, 1962, Mount Mantaling, Mantalingajan Range, Palawan, Philippines.

Genus usually merged into *Stachyris*. May form a superspecies with *Z. striatus*, *Z. latistriatus* and *Z. nigrorum*. Monotypic.

**Distribution.** SW Palawan (Mt Mantaling, Mt Borangbato), in W Philippine Is.



**Descriptive notes.** 14–15 cm. Has dull orangey-buff crown with dark markings at nape; dull buffy mid-grey head side to nape; upperparts olive-green, primary coverts dark brown, upperwing and tail greyish olive-brown, primaries with dull olive-yellow fringes; chin and throat whitish-buff to yellowish-grey, breast and belly olive-yellow with bold black streaks, flanks dull greyish olive-green; iris brown to chestnut-brown; bill blackish-horn, paler lower mandible; legs olive grey-horn. Differs from *Z. latistriatus* mainly in paler and plainer head, unstreaked throat. Sexes similar. Juvenile apparently undescribed.

**Voice.** Song described as such: a distinctive "zeep zeep zeep" second note highest, fourth lowest, may function as song. Reported as having varied calls, including "burbling noises".

**Habitat.** Montane evergreen forest, at 1000–2030 m.

**Food and Feeding.** Insects; seeds and vegetable matter found in two stomachs. In pairs and in small groups of five or so individuals, foraging at all levels in forest but mostly in canopy. Gleans from leaves and branches.

**Breeding.** Birds in breeding condition in Apr–May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Palawan EBA. Common, and likely to be relatively secure in remoter montane habitat, but has tiny global range. Formerly considered Vulnerable.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (1991), Evans & Kennedy (1990), Kennedy *et al.* (2000), Mallari (1971), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## Genus *ALCIPPE* Blyth, 1844

### 38. Grey-cheeked Fulvetta

#### *Alcippe morrisonia*

**French:** Alcippe à joues grises **German:** Grauwangenalcippe **Spanish:** Fulveta Carigris  
**Other common names:** Common/Red-eyed Fulvetta, Grey-eyed Nun-babbler

**Taxonomy.** *Alcippe morrisonia* Swinhoe, 1863, Taiwan.

Geographical variation slight, despite number of named races. Nevertheless, future splitting of species possible on basis of vocalizations and genetic differences. Individuals of this species observed in C Yunnan and N & C Guangdong (S China) not yet assigned to race. Eight subspecies recognized.

**Subspecies and Distribution.**

*A. m. yunnanensis* Harington, 1913 – N Myanmar and S China (NW Yunnan, SW Sichuan).

*A. m. fratercula* Rippon, 1900 – C, E & S Myanmar, S China (SW Yunnan), N & W Thailand and NW Laos.

*A. m. laotiana* Delacour, 1926 – NC & C Laos and adjacent Vietnam (N Annam).

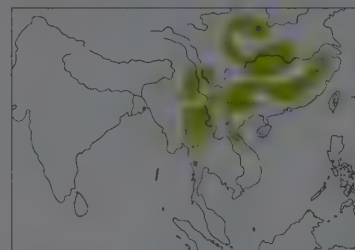
*A. m. schaefferi* La Touche, 1923 – S China (SE Yunnan E to S Guizhou and N Guangxi) and N Vietnam (Tonkin).

*A. m. davidi* Sytan, 1896 – EC China from S Gansu and S Shaanxi S to C & E Sichuan, SW Hubei, N & E Guizhou, SW Hunan, extreme NE Guangxi and NW Jiangxi.

*A. m. hueti* David, 1874 – SE China (SE Anhui and Zhejiang S to NE Guangdong).

*A. m. rufescens* (E. J. O. Hartert, 1910) – Hainan I.

*A. m. morrisonia* Swinhoe, 1863 – Taiwan.



**Descriptive notes.** 12.5–14 cm; 12–19 g. Small, soft-coloured nondescript "nun-babbler" with dull grey head, olive-grey upperparts and buffy-white underparts. Nominative race has crown to mantle and side of face to neck side rather dark slate-grey, long, vague dull blackish lateral crownstripe from above lores back to nape side; upperparts rufescent-tinged mid-brown, somewhat greyer and duller on mantle; upperwing and tail grey-brown, outer primaries with creamy buff fringes, carpal edge whitish; lores to upper bill base buffy white, chin and throat buffy white, shading buffier and greyer on breast side, flanks, thighs and

vent; iris crimson to dark crimson or chestnut, prominent broad whitish orbital ring; bill grey-brown to blackish-brown or black; legs grey-brown, tinged greenish or yellowish. Distinguished from congeners by combination of grey crown and head side to mantle, clear blackish lateral crownstrips, strong white eyering, distinctly buff underparts. Sexes similar. Juvenile has iris yellowish-brown or reddish-brown. Race *yunnanensis* has whitish-grey lores, greyish-buff chin and throat, and more extensively darker buff underparts than nominate; *fratercula* is like previous but less rich buff below, slightly warmer above, with more prominent lateral crownstrips; *laotiana* has strong lateral crownstrips like last, but is intermediate below between previous and following races; *schaefferi* is like *fratercula* but with very faint lateral crownstrips, usually warmer above, paler ventrally, greyish-white throat with very faint dark streaks, greyer malar area, pale slightly vinous wash on breast, whitish belly centre; *davidi* is very similar to previous, but head a shade browner, lateral crownstrips virtually invisible; *hueti* is similar but chin and throat greyer; *rufescens* is also similar, but darker-crowned and greyer on neck side. **Voice.** Song a repeated series of high-noted phrases, in NW Thailand "it-chi wi-wi", "ii chu chi-wi", "ii yu yu-wi" and "ii yu yu-wi", etc., in N Vietnam (E Tonkin) similar "it'i u-iwi-u-i-i" and "it'i-u-iwi-u-i-i", etc.; in all areas, song normally ends with 2–3 distinctive, curious buzzy "eerh" sounds. Calls with nervous "chr'r'r'r" and "chr'r'r'r'tt" and similar, and harsh "chittitit".

**Habitat.** Montane broadleaf evergreen forest, secondary forest, scrub, bamboo; in Taiwan prefers trees of the families Lauraceae and Fagaceae, but nests mostly in shrubs within forest. Found at 200–3050 m in mainland China, 600–3000 m in Taiwan (in N Taiwan 50–2780 m); 600–2565 m in SE Asia.

**Food and Feeding.** Small insects, seeds and berries. In 626 gut samples from Taiwan, invertebrates (arthropods) formed 85–90% and plant matter 10–15% of food in spring and summer, and respectively 35–55% and 45–65% in autumn and winter; arthropod composition of diet by volume was Hymenoptera 32%, Coleoptera 32%, Lepidoptera 10%, Diptera 9%, Homoptera 5%, Hemiptera 5%, Arachnida 3%, Orthoptera 2%, rest 2%, but with coleopterans eaten mainly in spring and summer and hymenopterans (ants, bees and wasps) mainly in autumn and winter. Commonest food fed to nestlings are larvae of Lepidoptera and Hymenoptera (79%). Keeps to middle storey and low undergrowth. In parties, often forms main component species of mixed feeding flocks, which may include other small babblers.

**Breeding.** Mar–Jul in mainland China, Apr–Aug (peak May–Jun) in Taiwan, and Feb–Jul in SE Asia; multi-brooded. Nest, built by both sexes, a very compact, fairly strong cup or hanging-basket, made of pliable strips of bark, leaf skeletons, bamboo or other leaves, leaf stems, fine twigs, grasses, pine needles, bits of fern skeleton, green moss and spider web, compactly lined with soft (often red or black) fibres, fern stems, pine needles, roots and fine twigs, placed 0.2–2 m above ground in low bush or bramble, suspended by rims from fern or dwarf bamboo stems or twigs of overhanging branches. Clutch 2–4 eggs, usually 4 in China and Taiwan (often 3 in latter), whitish to pinkish-white, irregularly mottled and streaked with rusty-red to pale rose over underlying markings of lavender, or (commonly in SE China) pale livid-pink with claret marks over violet-grey blotches with numerous short hair-lines; incubation by both sexes, more by female during day and exclusively by female at night, period 12–14 days; nestling period 9 days; young fed for 40–65 days after fledging. In one study in Taiwan, natural mortality 34% per year, owing mainly to cold weather in Jan–Feb; annual post-fledging disappearance rate varied from 53% to 86%.

**Movements.** Resident, some possible movement, as recorded only in winter in Hong Kong.  
**Status and Conservation.** Not globally threatened. Common in C & S China, and in S China recently recorded at 45 (83%) of 54 sites surveyed, including Shaxianshan National Nature Reserve and Diding Nature Reserve (Guangxi), in both of which common; has been considered the most abundant babbler in SE China. In Taiwan the most abundant bird species in Fushan forest, and judged perhaps most abundant species in woodland throughout island; recorded density of 0.06 birds/ha in mixed coniferous forest in Yushan National Park, although this not a preferred habitat. Generally common in SE Asian range; locally very common in Myanmar, common in Doi Inthanon



National Park, in Thailand; in Laos, present in Phou Dendin and Nam Kading National Biodiversity Conservation Areas (NBCA) and common in parts of Xe Bang Nouan NBCA and Nakai-Nam Theun NBCA; present in Tam Dao National Park, Ba Be National Park and Na Hang Nature Reserve, in N Vietnam, and in three protected areas in the Annamese Lowlands Endemic Bird Area. In Taiwan, typhoons may have severe impact on populations, e.g. 35% drop in numbers at start of 1998 breeding season following typhoon "Amber" in Aug 1997.

**Bibliography.** Caldwell & Caldwell (1931), Chen Chaohieh & Hsieh Fushing (2002), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Cheng Tsohsin *et al.* (1963), Chou Liansiang *et al.* (1998), David & Gosselin (2002a), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Ding Tzungsu *et al.* (2002a), Dowell *et al.* (1997), Duckworth *et al.* (1998), Eames *et al.* (2001), Evans & Timmins (1998), Fang Wei-horn (2005), Hachisaka & Udagawa (1950, 1951), Harrington (1909, 1914a), Hill (2000), Hu Meofen (1999), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Hume & Davison (1878), King (1987), King & Han Lianxian (1991), King & Liao Weiping (1989), King *et al.* (1998), Kinnear (1929), Koh Chaonien & Lee Pelfen (2003), Kuo Wei-wang (2000), La Touche (1899, 1923, 1925–1930), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Li Peiyong (2003), Lin Ruyshing (1996), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Nguyễn Đức Tu *et al.* (2001), Oates (1883), Riley (1926), Robbins *et al.* (2006), Robson (2000), Robson *et al.* (1989), Rothschild (1926), Round (1999), Severinghaus & Blackshaw (1976), Shieh Baosen (2004), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounholine (1998), Smith *et al.* (1940, 1943), Smythies (1986), Stanford (1935), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stresemann (1923c), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Uchida & Kuroda (1916), Viney *et al.* (1994), Wang Zhijun (1983), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yen Chungwei (1990), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zhao Xiubi (1994), Zheng Baolai (1988), Zheng Zuoxin & Qian Yanwen (1973), Zhou (1989).

## 39. Nepal Fulvetta

### *Alcippe nipalensis*

**French:** Alcippe du Népal **German:** Nepalalcippe **Spanish:** Fulveta Nepalesa  
**Other common names:** White-eyed/Black-eyebrowed Fulvetta, Nepal (Quaker) Babbler

**Taxonomy.** [Mesia] Siva *Nipalensis* Hodgson, 1837, Nepal. Proposed race *commoda*, from NE India (Assam) and N Myanmar, considered better merged with nominate. Two subspecies recognized.

**Subspecies and Distribution.**  
*A. n. nipalensis* (Hodgson, 1837) – Nepal E to Bhutan and NE India (Arunachal Pradesh, Assam, Nagaland, Manipur) and adjacent S China (SE Xizang) and N Myanmar.  
*A. n. stanfordi* Ticehurst, 1930 – E Bangladesh, NE India (Mizoram) and W Myanmar.



**Descriptive notes.** 12.5–13 cm; 13–18 g. Nominant race has crown to upper back pale brown-tinged grey, shading to pale warm brown on rest of upperparts, upperwing and tail, with soft-edged but broad blackish-brown lateral crownstreaks extending to mantle; lores whitish, supercilium, ear-coverts, cheek and submoustachial area and neck side pale brown-tinged grey (slightly paler than crown); chin whitish, shading to buffish-white on breast and to greyish-buff on flanks and thighs, mid-breast to mid-belly whitish; iris brown, white eyering; bill dark horn, pale base of lower mandible; legs pinkish-brown. Distinguished from similar

*A. morrisonia* (e.g. of race *yunnanensis*) by brown tinge on crown and nape, more pronounced blackish lateral crownstreaks, more rufescent upperparts and tail, pale lores and chin, stronger white eyering, whitish centre of throat, less buffy underparts. Sexes similar. Juvenile has upperparts, flanks and vent warmer-tinged than adult. Race *stanfordi* is paler and colder-tinged than nominate, with greyer crown and nape, slightly less distinct lateral crownstreaks. Voice. Song "chu-chui-chiwi" and "ew-ew-uw-uw", etc., described also as short, simple, rather well-spaced "uu-uw-uw" or "iii-uw-uw" and similar, and as "ee ooee-eww" or extended "uu-uw ewew-eww"; considerably lower, slower and more spaced than that of *A. morrisonia*, and with no buzzy end notes. Calls "chrr-r-r" and the like, similar to those of *A. morrisonia*.

**Habitat.** Broadleaf evergreen forest, moist deciduous forest, forest edge, secondary growth, and bamboo. Found at 245–2285 m in Nepal and 600–2000 m in Bhutan; 300–2100 m in India (foothills to highest summits in Assam); 900 m in Xizang; 440–2400 m in Myanmar.

**Food and Feeding.** Insects, nectar and berries, the last forming a large part of diet in Sept–Feb non-breeding period. Outside breeding season found in restless flocks of up to 20 individuals, usually joining mixed flocks, which may include other small babblers. Forages mostly in undergrowth and crowns of lower trees, occasionally on ground. Flocks move very quickly.

**Breeding.** Mar–Jul. Nest, built by both sexes, usually a neat and compact deep cup, rarely loosely woven and semi-transparent, made of dead bamboo or other leaves, fine grasses, fern fronds, fine fern roots, moss roots, fine black roots, bark fibre and tattered palm bark, sometimes plastered with spider web, lined with moss roots, rootlets, fine black roots, and black and dark brown fibres, placed 0.3–1.5 m above ground in bush, bamboo clump, rattan or underbrush. Clutch 2–5 eggs, usually 3–4 in Nepal and India, china-white to pinkish or reddish-tinged white, speckled or blotched with reddish-brown to purplish-red; incubation by both sexes, period 12 days. No information on nestling period.

**Movements.** Resident. Description as common winter visitor in Nameri National Park, in Assam (NE India), implies seasonal altitudinal movements, but this otherwise undocumented and improbable.

**Status and Conservation.** Not globally threatened. Generally uncommon to locally common in Nepal. Common in Bhutan in foothills and C & E valleys, with density near Zhengang of 1.4 territories/km of road at 1600–1900 m; present in Thrumshingla National Park. Common from Sikkim E to NE India, where present in Buxa Tiger Reserve (West Bengal), Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (Arunachal Pradesh), Balphakram National Park (Meghalaya), Barail Reserve Forest (Assam), and Nengping Wildlife Sanctuary and Dampa Tiger Reserve (Mizoram), and probably in other protected areas. Common in Myanmar. Locally common in restricted range in Xizang (S China).

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1999), Baqar & Sharma (2003), Beis (1947, 1950), Brand & Pawar (2004), Choudhury (2003), Cox (1987), Godwin-Austen (1870), Grimmett *et al.* (1998), Hopwood (1912), Hume & Macleay (1913), Hume & Oates (1889), Issakov & Issakov (1991), Issakov *et al.* (2000), Katti *et al.* (1992), Koelz (1954), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), Mayr (1938), Rasmussen & Anderson (1990), Ripley (1950), Robinson & Kloss (1919), Stresemann (1923c), Ticehurst (1935), Stanford (1935), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1933, 1938), Stevens *et al.* (1938), Stresemann & Henrichs (1940a), Suaragay & Joshua (1997), Ticehurst (1933), Yen Kwokying (1936), Zheng Zuoxin *et al.* (1983).

## 40. Mountain Fulvetta

### *Alcippe peracensis*

**French:** Alcippe bridé **German:** Malaialcippe **Spanish:** Fulveta Montana

**Taxonomy.** *Alcippe peracensis* Sharpe, 1887, Larut Range, Perak, Peninsular Malaysia. Formerly treated as conspecific with *A. grotei*. Two subspecies recognized.

**Subspecies and Distribution.**  
*A. p. annamensis* Robinson & Kloss, 1919 – SC & S Laos, E Cambodia and Vietnam (C & S Annam).  
*A. p. peracensis* Sharpe, 1887 – extreme S Thailand and Peninsular Malaysia.



**Descriptive notes.** 14–15.5 cm. Nominant race has crown slaty, grey extending slightly onto mantle, bold black lateral crownstreak; upperparts faintly rufescent-tinged drab olive-brown; largely whitish below, with very light buffish creamy brown wash on throat side, breast and flanks, and pale greyish olive-brown lower flanks and vent; iris red to dark brown; bill blackish-horn or greyish-horn to grey or plumbeous; legs pale fleshy brown or yellowish-brown to pale olive-brown. Differs from similar *A. morrisonia* in having crown slatier with bolder lateral stripes, upperparts drabber, underparts whitish. Sexes similar. Juvenile has

head and mantle duller grey than adult, lateral crownstreaks less distinct, duller above, bill greyish. Race *annamensis* has paler grey crown, nape and head side than nominate, less rich upperparts, paler and drabber below, with less buff-tinged wash on breast. Voice. Song in Indochina (race *annamensis*) "iti-iwu uwi-u wheer wheer", "iti-iti-iwu wi-wui wheer wheer" and similar, reminiscent of song of *A. morrisonia* (with similar buzzy end notes) but somewhat faster and shorter; in Peninsular Malaysia (nominate) similar "iti-iwu-wi-wi" and "iti-iwu-u-wi", etc., but apparently with no buzzy end notes. Calls harsh "chrr-r-r" and the like, similar to those of *A. morrisonia*.

**Habitat.** Montane broadleaf evergreen forest and *Fokienia* forest, at 900–2100 m in Indochina, 760–2190 m in Peninsular Malaysia.

**Food and Feeding.** Insects. Found in pairs or in small parties of five or six individuals, often associating with other species, including other small babblers, in mixed flocks.

**Breeding.** Jan–Jun in Vietnam and Mar–Jun in Peninsular Malaysia. Nest a small cup made of dead leaves, moss and rootlets, placed 1.5–1.8 m above ground in bush, sapling or tangle of ferns, etc. Clutch 2 eggs, white or whitish, richly blotched and/or spotted with brown to dull brownish-crimson. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Generally common across range. In Laos, very common in Dong Hua Sao National Biodiversity Conservation Area (NBCA), and present in Phou Xang He NBCA. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam); at latter site, density estimate of 3.26±0.87 birds/ha, yielding population estimate for the reserve of 28,190 individuals. In Peninsular Malaysia, common on Gunung Tahan and Bukit Fraser, and in Taman Negara National Park.

**Bibliography.** Collar (2006), Davidson *et al.* (1997), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Eames (1995), Eichler (1989), Engelbach (1932), Evans *et al.* (2000), Hill *et al.* (2001), Lekagul & Round (1991), Madoc (1956), Medway & Wells (1976), Robinson (1928), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993a, 1993b), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Thewlis, Duckworth *et al.* (1996), Thewlis, Timmins *et al.* (1998), Timmins & Wilkinson (1996).

## 41. Black-browed Fulvetta

### *Alcippe grotei*

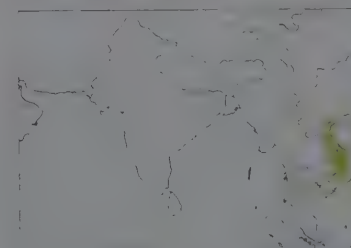
**French:** Alcippe de Grote **German:** Weißbauchalcippe **Spanish:** Fulveta Cejinegra  
**Other common names:** Eyebrowed Fulvetta

**Taxonomy.** *Alcippe nipalensis grotei* Delacour, 1936, Col des Nuages (16°11'N, 108°08'E), Annam, Vietnam.

Formerly treated as conspecific with *A. peracensis*. Race *eremita* poorly differentiated, and perhaps not worthy of recognition. Two subspecies currently recognized.

**Subspecies and Distribution.**  
*A. g. eremita* Riley, 1936 – SE Thailand.

*A. g. grotei* Delacour, 1936 – C & S Laos, E Cambodia and Vietnam.



**Descriptive notes.** 15.5–16.5 cm. Crown and nape are dull grey, shading to dull rufous-tinged brown on upperparts, upperwing and tail; blackish line beginning before eye as supercilium and trailing back as lateral crown-stripe onto nape; lores, postocular supercilial area, ear-coverts and cheek a shade paler grey than crown, shading on submoustachial area to whitish-buff chin and pale grey-tinged buffy throat and upper breast, becoming warmer and greyer on flanks, thighs and vent; lower mid-breast to centre of belly whitish; iris pale grey to brown, whitish weak broken eyering; bill blackish, yellowish-grey or bluish-horn; legs

greyish, reddish-grey or greyish-flesh. Differs from similar *A. peracensis* in larger size but distinctly shorter tail, brownish tinge on head and, especially, neck, more rufescent upperparts, only indistinct eyering. Sexes similar. Juvenile is warmer above and with browner head than adult. Race *eremita* is slightly greyer above than nominate. Voice. Song "yu-chi-chiwi-chu-woo", "yu-uwii-iu-woo", "yu-uwii-uw-woo", "yu-uwii-uw-uw-woo", "yu-yui-yui-uw-uw-uw-uw" and similar, like that of *A. ptoicephala* but usually rises less at end. When alarmed, utters harsh rasping spluttering "wit-it-irrit", "wittitrit", "wittitrit", "err-ritritritrit", etc.

**Habitat.** Broadleaf evergreen and semi-evergreen forest, logged and secondary forest, and scrub, at up to 1200 m.

**Food and Feeding.** Presumably small invertebrates and some vegetable matter; strangler figs reported, although possible that insects in fruit were the target. Usually found in small or medium-



sized parties, often in association with other species, including other babblers; often forms nucleus of mixed feeding flocks. Forages in middle storey and undergrowth.

**Breeding.** Feb–Jul in Vietnam. Nest a lightly built cup attached to stems of overhanging fern 1 m above ground. Clutch 3 eggs. No further information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common across range. Abundant in Xe Pian National Biodiversity Conservation Area (NBCA), Dong Hua Sao NBCA and Phou Xang He NBCA, in Laos. Locally common resident in E Tonkin (in Cuc Phuong National Park), N & C Annam (Bach Ma National Park) and Cochinchina (uncommon in Nam Bai Cat Tien National Park), in Vietnam; present in many other protected areas (although currently listed under *A. peracensis* in certain publications, making enumeration impossible). First confirmed records in Cambodia in 2002.

**Bibliography.** Collar (2006), David-Beaulieu (1932), Davidson *et al.* (1997), Delacour & Jabouille (1931a), Duckworth & Hedges (1998), Eames *et al.* (2001), Engelbach (1932), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Robson (2000), Robson *et al.* (1993b), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Thewlis, Duckworth *et al.* (1996), Thewlis, Timmins *et al.* (1998), Timmins & Trinh Viet Cuong (1999).

## 42. Brown-cheeked Fulvetta

### *Alcippe poioicephala*

**French:** Alcippe à joues brunes **German:** Graukopfalcippe **Spanish:** Fulveta Cariparda  
**Other common names:** Common/Grey-eyed Fulvetta; (Nilgiri) Quaker Babbler (*poioicephala*)

**Taxonomy.** *Thimalia* [sic] *poioicephala* Jerdon, 1841, Coonoor Ghat, Nilgiri Hills, India. Has sometimes been considered conspecific with *A. pyrrhoptera*. Races in peninsular India (nominate and *brucei*), with somewhat different songs from those of other races, considered possibly to represent separate species. Eight subspecies recognized.

**Subspecies and Distribution.**

*A. p. brucei* Hume, 1870 – C & S India.

*A. p. poioicephala* (Jerdon, 1841) – Western Ghats, in W India.

*A. p. fusca* Godwin-Austen, 1877 – E Bangladesh and NE India (S Assam) E to N, NW & NC Myanmar.

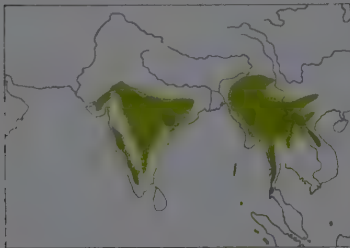
*A. p. phayrei* Blyth, 1845 – SW Myanmar (E to R Irrawaddy).

*A. p. haringtoniae* E. J. O. Hartert, 1909 – E Myanmar and NW Thailand.

*A. p. alearis* (Bangs & Van Tyne, 1930) – S China (SE Yunnan), N & C Laos, N Vietnam (W Tonkin) and N Thailand.

*A. p. karenii* Robinson & Kloss, 1923 – SE & S Myanmar (S to N Tenasserim) and adjacent W Thailand.

*A. p. davisoni* Harington, 1915 – extreme S Myanmar (S Tenasserim) and N peninsular Thailand.



**Descriptive notes.** 16.5 cm; 17–23 g. Relatively large “nun-babbler” with greyish-buff head side, distinctly buff underparts; lacks white eyering. Nominative race has crown dull, slightly brown-tinged grey, shading to dull rufous-tinged brown on upperparts, with stronger chestnut-brown on upperwing and tail; lores, superciliary area, ear-coverts, cheek and neck side a shade paler than crown; chin, submoustachial area and underparts very pale buffy tan, belly whitish-buff, flanks buffish-tan; iris dull white to greyish-brown, sometimes brown; upper mandible blackish-horn to dark grey, lower mandible greyish or bluish;

legs greyish-brown to flesh-pink. Sexes similar. Juvenile has upperparts, edges of wings and tail browner, iris slate-grey, gape and mouth bright yellow, paler parts of bill yellowish. Races differ mainly in tone of plumage: *brucei* is slightly larger and paler overall than nominate, crown and nape mid-grey, head side, upperparts, underparts and wing fringes paler, tail not quite so dark; *fusca* has crown and nape slightly darker than previous, upperparts intermediate in tone between previous and nominate (lacking grey on back); *phayrei* is very like previous, but slightly colder above and below; *haringtoniae* has upperparts somewhat darker and richer than last, more rufous-tinged (approaching nominate), crown similar (pronounced crownstripes), head side and underparts richer; *alearis* is very like last above, but (apart from crown) very slightly more greyish-olive, lateral crownstripes extending forward to bill base (but extremely faint), head side duller and greyer, underparts slightly less rich buff, wings duller; *karenii* is roughly intermediate between *haringtoniae* and *phayrei*, with indistinct crownstripes; *davisoni* resembles last but with even less distinct crownstripes, and upperparts slightly darker. **VOICE.** Sings with repeated pleasant phrases of spaced, fairly even notes, which usually rise at end, “chu-uwí-uwí-uwí”, “i-chíwi-uwí-uwí”, “yí-chíwi-uwí-uwí” and similar, sometimes more slurred “ch’uwí-u-uwí-uwí”; songs of *brucei* and nominate have been described as having first few notes shorter than rest and rising slightly and last ones rising again slightly, with beginning and ending softer, e.g. “tu-wi-twee-tuu-twee-túúwée”, with some versions more drawn-out, some faster, and most ending on short downslur; songs of *fusca* similar but descend only slightly and then ascend strongly, the strophe tending upwards, e.g. “tú-tú-tú-tú-twee-túúwée”. Calls with harsh buzzy spluttering rattles when agitated, e.g. “wit-irrrr”, “witt-witt”, “witch-tittittit” and “whi-chirru”, also higher “whi-shihhihi”.

**Habitat.** Bushes and small trees in evergreen and mixed moist deciduous forest, teak, secondary growth, sholas, mixed bamboo-jungle, scrub, occasionally gardens. At 855–2100 m (up to 1000 m in E); in peninsular India; foothills to 1000 m in Bangladesh; 520 m in China; up to 1520 m (mainly below 1200 m) in SE Asia.

**Food and Feeding.** Ants and other insects; also nectar, particularly of *Erythrina*. Usually found in parties of 6–10 individuals, sometimes up to 20 or more. Forages in middle storey and undergrowth but also ascends to canopy; often 9 m above ground. Often forms nucleus of mixed-species feeding flocks.

**Breeding.** Jan–Nov in India, Mar–Sept in Bangladesh and Jan–Sept in SE Asia. Nest a roughly built compact deep cup, sometimes almost cone-shaped, made of green moss, dead leaves, grasses, grass roots, moss roots, rootlets, plant fibres and fine twigs, sometimes plastered with cobweb, lichen or wool, lined with black moss roots, fern roots, and rootlets, placed usually 0.6–1.8 m (sometimes 3 m) above ground in bush, sapling, bamboo or fern. Clutch 2–3 eggs, white to pale pink, with blotches, smudges and streaks of reddish-brown to purple-black and clouds of pale grey to inky-purple; incubation by both sexes. No other information.

**Movements.** Resident; described as a local migrant in Kaziranga National Park, in India, but this not substantiated by other evidence.

**Status and Conservation.** Not globally threatened. In India, common in W Mysore S to W Tamil Nadu; locally very common in hills of peninsular India; uncommon in Kaziranga and Nameri Na-

tional Parks (Assam); common in Khasi and Cachar Hills (Nagaland and Manipur), and present in *Ilampá Tiger Reserve* (Mizoram). Common at least locally in Bangladesh. Locally common in limited range in China. Generally common in SE Asian range; very common in Myanmar, common in Thailand, including in Doi Chiang Dao Wildlife Sanctuary (in NW), Khao Yai National Park (in NE) and Kaeng Krachan National Park (in W); present in Nam Kading National Biodiversity Conservation Area, in Laos; present in Ba Be National Park, in N Vietnam, and in five protected areas in the Annamese Lowlands Endemic Bird Area.

**Bibliography.** Ali & Ripley (1972), Atturi *et al.* (2000), Bangs (1921), Barua & Sharma (1999, 2005), Birand & Pawar (2004), Chasen (1939), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Collar (2006), Cox *et al.* (1992), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Duckworth *et al.* (1998), Eames *et al.* (2001), Grimmer *et al.* (1998), Hill (2000), Hopwood & Mackenzie (1917), Hume & Davison (1878), Hume & Oates (1889), King & Han Lianxian (1991), Lê Manh Hùng *et al.* (2002), Lekagul & Round (1991), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Nguyễn Đức Tú *et al.* (2001), Oates (1883), Rasmussen & Anderson (2005), Robinson (1928), Robson (2000), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Smith *et al.* (1943), Smythies (1986), Stanford (1935), Stanford & Mayr (1941), Stanford & Ticehurst (1930), Stresemann & Heinrich (1940a), Ticehurst (1933), Tizard *et al.* (1997), Wiles (1980), Yen Kwokying (1936), Zacharias & Gaston (1993).

## 43. Brown Fulvetta

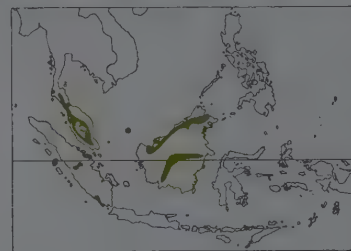
### *Alcippe brunneicauda*

**French:** Alcippe brun **German:** Braunschwanzalcippe **Spanish:** Fulveta Parda  
**Other common names:** Malaysian Fulvetta

**Taxonomy.** *Hyloterpe brunneicauda* Salvadori, 1879, “Ayer Manchor”, a waterfall 10 kilometres from Padang Panjang (0°29' S, 100°22' E) on the road to the Padang Highlands, Sumatra.

Several races proposed, including *eriphaea* (Borneo), but differences trivial or undetectable in large samples. Monotypic.

**Distribution.** S Thailand, Peninsular Malaysia, Sumatra and Batu Is, N Natunas and Borneo.



**Descriptive notes.** 14.5–15 cm; 14.5–16 g. Nondescript “nun-babbler”, plain head without lateral crownstripes. Forehead, crown and nape are drab greyish mid-brown, head side paler and greyer, upperparts rather warm-tinged mid-brown, slightly more rufous-chestnut on rump and uppertail-coverts; upperwing blackish-brown on inner webs, outer fringes much paler rufescent brown; lores and submoustachial area greyish mixed with dull whitish; throat whitish, washed pale brown, lower throat side and wash across breast pale greyish-brown, tinged pinkish or creamy, belly whiter, breast side and flanks pale greyish-

brown, warm-tinged on lower flanks and thighs, vent whitish-brown; iris grey to dark brown; bill grey to dark brown, lower mandible often paler grey-brown; legs pale lavender to brown. Sexes similar. Juvenile presumably resembles adult. **VOICE.** Song a rather slow, measured, high-pitched and slightly undulating “hi-tu-tu ti-tu ti-tu”, “hi-tu hi-tu hi-tu” and “do-di-do-di-do-di-do” or descending “hi-tu-tu ti-tu ti-tu” and similar, repeated after rather long intervals. Calls with rather stressed “whit” notes and short harsh rattles.

**Habitat.** Primary evergreen forest, older secondary forest, overgrown forest clearings, rubber and *Albizia*, lightly logged forest; often close to streams. Up to 900 m in Thailand and to 760 m in Peninsular Malaysia; to 1000 m in Sumatra; generally to 1200 m, rarely 1430 m, in Borneo.

**Food and Feeding.** Insects, including beetles (Coleoptera), caterpillars, grasshoppers (Orthoptera); also red berries. Found in pairs or in small parties, often in company with other species in mixed flocks. Usually forages in lower middle storey, sometimes in low vegetation, by gleaning foliage.

**Breeding.** Apr–May in Thailand, Jun in Natunas and Sumatra; in Borneo, birds in breeding condition in May–Jul (Sabah), dependent juvenile in Aug, and adult feeding young in Feb. Nest reported in Thailand, but undescribed. No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Generally uncommon to fairly common in continental range: fairly common in S Thailand; common in Taman Negara National Park, in Peninsular Malaysia. Uncommon in primary and secondary habitats in Sumatra, where present in Gunung Leuser and Bukit Tigapuluh National Parks; uncommon in Batu Is. Widespread in lowland mixed dipterocarp forests in Borneo, and common in Sabah, including in Danum Valley Conservation Area and on Mt Kinabalu; commonest bird species on Mt Penrissen, in Sarawak, and frequent in Berau district forest, in E Kalimantan; present in Similajau National Park (Sarawak) and Tanjung Puting National Park (S Kalimantan), and common in Gunung Niut Nature Reserve (W Kalimantan). A Sundaic lowland-forest species, thus highly susceptible to the extensive forest destruction throughout its range; preference for submontane forests and use of second growth, however, imply that it is not immediately at risk.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth & Kelsh (1988), Duckworth *et al.* (1997), Eames (2005), Holmes (1996), Johns (1989), Lekagul & Round (1991), van Marle & Vooijs (1988), Medway & Wells (1976), Nash & Nash (1988), Oberholser (1932), O’Brien & Kinnaird (1996), Priemé & Heegaard (1988), Robinson (1928), Robson (2000), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## 44. Javan Fulvetta

### *Alcippe pyrrhoptera*

**French:** Alcippe de Java **German:** Rotrückenalcippe **Spanish:** Fulveta de Java

**Taxonomy.** [Apothera], *pyrrhoptera* Bonaparte, 1850, Java.

Has been treated as a race of *A. poioicephala*. Monotypic.

**Distribution.** W & C Java.

**Descriptive notes.** 14.5–15 cm. Dull chestnut and buff “nun-babbler”. Has crown to back dull chestnut-brown, very faint darker lateral crownstripes from above lores to nape, colour intensifying to rufous-chestnut on rump and uppertail-coverts, upperwing-coverts and wing fringes, tail deep warm brown with dark rufescent-chestnut outer fringes, particularly towards base; lores buffish, cheek and ear-coverts pale brownish-tan with whitish spots, throat pale to whitish-buff, richer on







Wildlife Sanctuary. Uncommon in China. Generally fairly common to common in SE Asian range: common in Myanmar, although uncommon in Natmoutang National Park; common in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. Fairly common in Fan Si Pan National Park and present in Vu Quang Nature Reserve, in Vietnam.

**Bibliography.** Ali & Ripley (1972), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Choudhury (2003), Davidson (1995), Delacour & Jaudouin (1984), Dowell *et al.* (1997), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Harington (1909, 1914a), Hopwood & Mackenzie (1917), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Hume & Davison (1878), Hume & Oates (1889), King & Han Lianxian (1991), Kinnear (1929), La Touche (1923), Lee Kwok Shing *et al.* (2006), Oates (1980), Rasmussen & Anderton (2005), Riley (1926), Ripley (1952), Robson (2000), Singh (1995), Smith *et al.* (1940, 1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stresemann & Heinrich (1940a), Stuart Baker (1893), Tan Yaokuang & Cheng Tsohsin (1964), Thet Zaw Naing (2003), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Uchida & Kuroda (1916), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yen Kwokying (1934b, 1936).

## 47. Dusky Fulvetta

### *Schoeniparus brunneus*

**French:** Alcippe de Gould **German:** Rotkopfalcippe **Spanish:** Fulveta de Gould  
**Other common names:** Brown-capped/Brown-eared Fulvetta, Rufous/Rufous-headed Fulvetta, Gould's Fulvetta/Nun-babbler

**Taxonomy.** *Alcippe brunnea* Gould, 1863, Taiwan.

Genus usually merged into *Alcippe*. Suggested as forming a superspecies with *S. dubius*, and often considered conspecific, but the two occur sympatrically in China and differ morphologically. Five subspecies recognized.

**Subspecies and Distribution.**

*S. b. olivaceus* (Styan, 1896) – SC China (C & E Sichuan E to S Shaanxi, W Hubei and N Guizhou).  
*S. b. weigoldi* Stresemann, 1923 – Red Basin of Sichuan (China).

*S. b. supercilialis* (David, 1874) – SE China (E Guangxi E to F Hunan, SE Anhui, SW Zhejiang, N Fujian and N Guangdong).

*S. b. argutus* (E. J. O. Hartert, 1910) – Hainan I.

*S. b. brunneus* (Gould, 1863) – Taiwan.



**Descriptive notes.** 13–15 cm; 15–23 g. Nominative race has forehead to rump, upperwing and tail dull rufescent brown, long, broad blackish lateral crownstripe from above eye to rear nape side; lores and supercilium drab greyish-brown, ear-coverts and area behind them buffy grey; throat and central belly whitish, submoustachial area similar but feathers flecked dark greyish-brown; breast and upper flanks greyish-buff, shading to dirty greyish-brown on lower flanks, thighs and vent; iris brownish-reddish; bill black to dark brown; legs yellowish to yellowish-grey, sometimes tinged pink. Distinguished from *S. dubius* by very different facial appearance, with supercilium and neck side grey and ear-coverts buffy grey. Sexes similar. Juvenile is presumably as adult. Race *olivaceus* is paler on head, with less rufescence on forehead, weaker crownstipes, slightly ochraceous lower flanks to vent; *weigoldi* has mid-crown and nape darker, throat and mid-belly clearer white, breastband very pale; *supercilialis* has more rufescent upperparts with less obvious dark fringes of crown feathers, paler head side, more contrasting blackish submoustachial area, whiter throat and mid-belly, paler breast, very faint streaking on throat and breast, warmer-coloured lower flanks to vent; *argutus* is like last, but lores and ear-coverts slightly paler, bill slightly thinner. **Voice.** Song on Emei Shan (Sichuan) delivered in hurried, loud, shrill, nervous phrases of 4–5 notes, “wi wi-wi-wi-uu”, “uu wi-wi-wi-chuu”, “yu wi-wi-wi-uu” and the like, repeated every 7–8 seconds; similar to songs of *S. dubius* and *S. rufogularis*. Rather low “jurt” calls repeated by foraging birds.

**Habitat.** Broadleaf evergreen forest, grass-jungle, at 600–1700 m in China; mainly 1525–1830 m in Taiwan (elevation limits in N Taiwan 40–1590 m).

**Food and Feeding.** Insects, snails and seeds found in stomachs. Feeds on or near ground, skulking, in small parties; seen to move under leaf litter to forage.

**Breeding.** Apr–Jun. Nest a loose dome or semi-dome, with entrance at upper part, made of leaf fibres, dead leaves (including those of *Miscantheus*) and grass, lined with dry grass, placed 0.1–2.5 m above ground in bush. Clutch 4–5 eggs, in Taiwan clutch size given as 2–3; white (Taiwan) to greenish-white, blotched or mottled/clouded with various shades of brown over spots of pale lilac and grey/blue-grey, sometimes with dark brown specks and short lines. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common to common in S China, where recently recorded at 15 (28%) of 54 sites surveyed (52 of which are nature reserves); widespread in wooded hills in Guangdong. Common in Taiwan.

**Bibliography.** Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Dowell *et al.* (1997), Hachisuka & Udagawa (1950, 1951), Huang Qiang *et al.* (1995), King (1989a), King & Liao Weiping (1989), King & Zheng Guangmei (1988), Kleefisch (1995), Koh Chaonien & Lee Peifen (2003), La Touche (1899, 1925–1930), Lee Kwok Shing *et al.* (2006), Lewthwaite (1996), Liu Kazhi *et al.* (1994), Meyer de Schauensee (1984), Ogilvie-Grant (1906), Severinghaus & Blackshaw (1976), Smith & Yu Hontsen (1992), Stresemann (1923c), Viney *et al.* (1994), Wu Zhikang *et al.* (1986), Yen Chungwei (1990), Yen Kwokying (1934a, 1936), Zheng Zuoxin & Qian Yanwen (1973).

## Genus RHOPOCICHLA Oates, 1889

### 48. Dark-fronted Babbler

#### *Rhopocichla atriceps*

**French:** Timalie à tête noire **German:** Kapuzentimalie **Spanish:** Timalí Frentinegro  
**Other common names:** Black-headed/Black-fronted Babbler

**Taxonomy.** *Brachypteryx*, *atriceps* Jerdon, 1839, the Wynad, south-west India.

Has been placed in genus *Alcippe*. Four subspecies recognized.

**Subspecies and Distribution.**

*R. a. atriceps* (Jerdon, 1839) – Western Ghats (from Belgaum S to Palghat Gap), in SW India.

*R. a. bourdilloni* (Hume, 1876) – SW India (Kerala and W Tamil Nadu).

*R. a. siccata* Whistler, 1941 – C Sri Lanka.

*R. a. nigrifrons* (Blyth, 1849) – SW Sri Lanka.



**Descriptive notes.** 13 cm; 16–17 g. Compact square-tailed brown-backed babbler with variably dark head, yellowish eye and whitish underparts. Nominative race has head (down to moustachial line, cheek and ear-coverts) blackish-brown, upperparts, upperwing and tail warm olive-brown; chin, throat and submoustachial area pure white; breast, upper flanks and belly white, tinged grey, lower flanks, thighs and vent dull ochrous-buff; iris pale yellow; upper mandible dark horn-brown, lower mandible pale greyish-flesh; legs pinkish-grey. Sexes similar. Juvenile has black of head side less sharply defined, edges of wings

and tail rustier. Race *bourdilloni* has crown, nape, lores and cheek sooty brown, more extensive and richer ochre on lower underparts; *siccata* has colour of upperparts extending onto head as far as mid-crown, breast and central belly cleaner white (as throat); *nigrifrons* is like previous but richer-toned above. **Voice.** Song, if any, unreported. Utters sundry squeaks, including excited clattery rattle, e.g. “kt’t’t’t”, kt, kt’t’t”, in short bursts and long series, and a harsh, rather subdued “chur-chur-r” when on move in flock; alarm a rattling “chur-r”.

**Habitat.** Undergrowth and clearings in forest, secondary growth, overgrown plantations, sholas, thickets near streams, dense and marshy jungle, cardamom cultivation, scrub, reedbeds, bamboo-jungle and cane brakes in dank ravines; lowlands to 1800 m, mainly above 600 m in India, but to 2100 m in Sri Lanka.

**Food and Feeding.** Insects. Found in parties of up to 12 or more individuals (but mean group size in one study only 3–3), often in association with other babblers. Seldom ascends more than 1–2 m above ground.

**Breeding.** Most months but mainly Mar–Jul in India, and in all months (with least activity Jun–Sept) in Sri Lanka. Nest a loose dome made of dry bamboo or other leaves, grasses and twigs, lined with black rootlets and grasses, placed 0.6–1.2 m above ground in thick shrub, brambles, grass, reeds or weeds; also builds “cock nests”, very loosely and untidily made balls of bamboo leaves, unlined and usually in full view, not used for breeding although up to four birds may roost in them (three or more such nests may be found close together, the product of up to 4–5 birds); breeding nest may be used as a family roost for some time after young fledged. Clutch 2–3 eggs, usually 2, white to greyish-white or fleshy white, with little spots of reddish-brown and purplish-red, sometimes with underlying specks of bluish-grey. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common in India, where present in Mudumalai National Park (Tamil Nadu); in surveys in 1973–1997 in Western Ghats, found to be mostly common to abundant in 22 areas, including eight protected areas, namely Sultan’s Battery, Silent Valley, Parambikulam, Munnar, Periyar East, Periyar West, Tenmalai and Agastiamalai. Widespread in lowlands and hills in Sri Lanka, and common in Sinharaja Forest Reserve.

**Bibliography.** Ali & Ripley (1971), Belts (1935), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Harrison (1999), Henry (1998), Hume & Oates (1889), Kotagama & Fernando (1994), Kotagama & Goodale (2004), Legge (1880), Phillips (1978), Rasmussen & Anderton (2005), Wait (1925), Yen Kwokying (1936), Zacharias & Gaston (1993, 1999).

## Genus DUMETIA Blyth, 1852

### 49. Tawny-bellied Babbler

#### *Dumetia hyperythra*

**French:** Timalie à ventre roux **German:** Rotbauchtimalie **Spanish:** Timalí Ventrirrúfo  
**Other common names:** White-throated Babbler; Rufous-bellied Babbler (*hyperythra*)

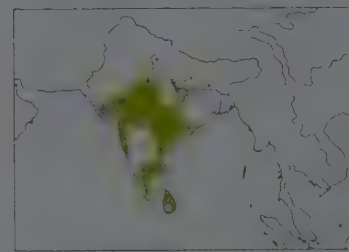
**Taxonomy.** *Timalia hyperythra* Franklin, 1831, Ganges between Calcutta and Benares (Varanasi), India. Proposed race *abuensis* (from W India) considered inseparable from *albogularis*. Three subspecies recognized.

**Subspecies and Distribution.**

*D. h. hyperythra* (Franklin, 1831) – N, C & E India and S Nepal.

*D. h. albogularis* (Blyth, 1847) – W & S India.

*D. h. philipsi* Whistler, 1941 – Sri Lanka.



**Descriptive notes.** 13 cm; 10–15 g. Striking small babbler, ochrous-brown above and buffy rufous below, with longish graduated tail. Nominative race has forehead to mid-crown rusty brown, slightly darker lateral crownstripe, hinderown to back dull ochrous-brown, slightly paler on uppertail-coverts; upperwing and tail mid-brown; lores, supercilium and cheek buffy rufous with slight grey tinge; chin, throat, submoustachial area, neck side and underparts rich buffy rufous; iris hazel to creamy white; bill pale brown, paler lower mandible; legs pale yellowish to dusky-tinged yellowish-flesh. Sexes similar. Juvenile lacks rusty tinge

on forehead, underparts duller and paler. Race *albogularis* has white oval patch from chin to upper breast, small white patch on central belly, much paler head side than nominate, buffy rufous slightly paler, *philipsi* is like previous, but paler rufous below, with larger white patch on belly, larger bill, white on supercilium and ear-coverts. **Voice.** Clear whistling song of 7 notes, described also as pleasant, quick, thin, piercing, high-pitched but sharply descending whistling, first part very like song of Indian Bushlark (*Mphala erythraea*), latter part resembling canary-like notes of “sunbird”.

the two running into each other, "passi-yú" or "ssiiú", then "tit-ut-switt(-it)", "whit-ut" or "whit-it-it". Contact notes rather feeble but sharp staccato cheeping, "tit", "twit" and "tut"; varied occasionally by harsher twittering, especially when alarmed; also a soft "tack-tack", like sound made when two pebbles tapped together.

**Habitat.** Open wooded country and scrub, grassland dotted with shrubs, bamboo clumps, thorn-scrub, wasteland near forest, deciduous and mixed-deciduous scrub-jungle and forest; avoids pure evergreen stands. Has bred in compounds. Lowlands to 915 m, locally to 1800 m in S India; 75–305 m in Nepal.

**Food and Feeding.** Mainly insects, in Sri Lanka larvae and minute beetles (Coleoptera) noted; nectar of coral trees (*Erythrina*) and *Salmalia* also taken. Found in loose flocks of 5–12 individuals; moves through grass and feeds on ground among dead leaves, foraging in manner of a fulvetta.

**Breeding.** Jan–Oct; multi-brooded. Nest a loose or neat dome, with side entrance (sometimes towards top), made of coarse grasses, dead bamboo or other leaves, rarely paper shavings, scantily lined with fine grasses, grass roots, fern stems, hair and fine fibres, placed on ground among dead leaves or near ground among bamboo roots, grass or weeds, or in shrub, or thorny bush overgrown with creepers, usually below 1 m, sometimes up to 2 m above ground; in compound in India, once

nested at foot of cactus plant, once in *Jasminum* bush, both close to a house wall. Clutch 2–4 eggs, usually 3–4 in India, 3 in Sri Lanka, white or pinkish-white with speckles, spots, blotches or streaks of reddish-brown to purplish-grey; incubation period 13 days; nestling period 18 days maximum. Brood parasitism by Banded Bay Cuckoo (*Cucumantis sonneratii*) reported.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare and local in Nepal. Generally common in India, where seen intermittently in Rajaji National Park and common in Dudhwa National Park (both Uttar Pradesh), but rare in Dehra Dun valley (Uttaranchal), and uncommon in Ranthambhore Sanctuary (Rajasthan); in surveys in 1973–1997 in Western Ghats, found in 17 areas, including seven protected areas, namely Sultan's Battery, Silent Valley, Parambikulam, Munnar, Periyar East, Periyar West and Agastiamalai. Rare but widespread in Sri Lanka, although common in Uda Walawe National Park. Probably now extinct in Bangladesh.

**Bibliography.** Acharya (1951), Ali & Ripley (1971), Grimmett *et al.* (1998), Harrison (1999), Henry (1998), Inskipp & Inskipp (1991), Javed & Rahmani (1998), Kotagama & Fernando (1994), Legge (1880), Pandey *et al.* (1994), Phillips (1978), Rasmussen & Anderton (2005), Sankar *et al.* (1993), Singh (2000), Vyas (1999), Zacharias & Gaston (1993, 1999).





## PLATE 5

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *STACHYRIS* Hodgson, 1844

#### 50. Sooty Babbler

#### *Stachyris herberti*

French: *Amalite de Herbert*

German: *Laosbuschmalie*

Spanish: *Timali de Herbert*

Other common names: Laos Dusky Babbler

**Taxonomy.** *Nigravis herberti* Stuart Baker, 1920, Ban Sao, Thailand; error = Ban Lak Sao (18°11' N, 104°58' E), Laos.

Somewhat different in plumage from congeners, and sometimes placed in a genus of its own, *Nigravis*, but general consensus is that such treatment is unnecessary. A recently discovered babbler (with white-spangled breast and white rear ear-coverts) from S China may represent a well-marked race of present species or a new but closely related species. Monotypic.

**Distribution.** C Laos and C Vietnam (C Annam).

**Descriptive notes.** 16 cm, 29 g. Sooty-brown babbler with paler throat, and pale bill and eyering. Forehead, crown, lores, nape and line under eye, cheek and ear-coverts a shade darker, upperwing and tail blackish; chin whitish, shading to pale mouse-brown on throat, and smoky brown on neck side.



connecting around rear of ear-coverts to smoky-brown supercilium; iris brown, pale bluish-grey orbital ring; bill pale blue-grey to pinkish-grey; legs brown. Sexes similar. Juvenile is more uniformly brownish, lacks obvious eyering. **VOICE.** Song apparently unreported. Very soft, repeated "tip" and "tu-tip" and subdued metallic "cheet cheet cheet" contact notes uttered by foraging flocks; short, hard "wittitit" when agitated.

**Habitat.** Stunted but closed-canopy lowland broadleaf evergreen forest on limestone in vicinity of steep cliffs and outcrops, also fairly open vegetated karst; to at least 610 m.

**Food and Feeding.** Small invertebrates; those reported include a harvestman (Opiliones), caterpillar (Lepidoptera), possibly a bug (Hemiptera), stick-insect (Phasmatodea) and several small snails, which were hammered against rocks. Forages in single-species groups of 4–20 or more individuals, but sometimes joins bird waves. Commonly moves over surface of karst limestone, climbing vertically on rock faces, sometimes disappearing into holes, or in understorey of associated vegetation; also enters canopy layer, when frequently searches among vines and lianas, running rapidly along them with body held flat and tail slightly fanned.

**Breeding.** Mar and May in Laos. Only nest reported was placed on ledge in hollow in tree-enclosed karst, on rock face 2.5 m high, fibrous and leafy nest material being brought by two birds (and a third bird seen). No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Annamese Lowlands EBA. Fairly common in Vietnam at a single locality, Phong Nha Nature Reserve, in C Annam; locally common over a fairly wide area in Laos. Because the karst hills on which its habitat grows are so difficult to penetrate, it is relatively secure; forest destruction at foot of karst, however, may possibly remove an important habitat component, and this potential risk needs to be investigated. Present in Hin Namno, Khammouan Limestone and Nam Kading National Biodiversity Conservation Areas, in Laos.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames (2001), Eames, Evc & Tordoff (2001), Eames, Lambert & Nguyễn Cu (1995), Kalyakin (2003), Nguyễn Cu *et al.* (2000), Robson (2000), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart Baker (1920, 1921), Thewlis *et al.* (1998), Williamson (1945).

## 51. White-bibbed Babbler

### *Stachyris thoracica*

**French:** Timalie à col blanc **German:** Weißbrust-Buschtimalie **Spanish:** Timali Cuelliblanco  
**Other common names:** White-collared Babbler, White-collared Tree-babbler

**Taxonomy.** *Pitta thoracica* Temminck, 1821, Mount Salak (6°42' S, 106°44' E), west Java.  
Two subspecies recognized.

**Subspecies and Distribution.**

*S. t. thoracica* (Temminck, 1821) – W Java.

*S. t. orientalis* Robinson, 1918 – C & E Java.



**Descriptive notes.** 18 cm. Large *Stachyris* babbler with chunky bill, dull chestnut with distinctive blackish throat and broad irregular-edged white breastband. Nominative race has entire plumage dull dark chestnut-brown, except for dark grey face (lores, cheek, ear-coverts), blackish chin and throat (slightly darker than ear-coverts), sometimes with short extension onto upper mid-breast, and broad white band across upper breast to lower neck side, lower edge of this band shifting unevenly to colour of remaining underparts and sometimes vaguely bordered with greyish; iris red, pale blue orbital skin; upper mandible slaty black,

lower mandible caerulean blue with distal half pale yellowish-horn; legs greenish-slate or bluish-slate. Sexes similar. Juvenile apparently undescribed; museum specimen with greyer throat may be immature. Race *orientalis* has dark grey crown to nape and blackish lower border of white breastband. **VOICE.** Song apparently undocumented. Call a continuous low rumbling, pulsating "chr'r'r'r'r'r'r'r", also shorter "chr'r'chr'r'chr'r'chr'r", and abrupt "chrrp".

**Habitat.** Undergrowth and dense thickets in broadleaf evergreen forest, to 1600 m.

**Food and Feeding.** Insects; cockroach egg sacs (Blattodea), grubs and caterpillars recorded. Forages in small groups in low forest vegetation, occasionally ascending vine-covered trees and entering thickets in gardens. Shy.

**Breeding.** Feb and Oct in W Java. Nest an open solid cup of roots and rattan leaf tendrils, placed not far above ground. Clutch 2–3 eggs, white. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Java and Bali Forests EBA. Uncommon in Gunung Gede-Pangrango National Park, in W Java.

**Bibliography.** Andrew (1985), van Balen (1992), Bartels (1901), Hoogerwerf (1948, 1949, 1950a), MacKinnon (1988), van Marle & Voous (1988), Nijman & van Balen (1998), Sody (1956), Stattersfield *et al.* (1998), Voous (1948), Vorderman (1886).

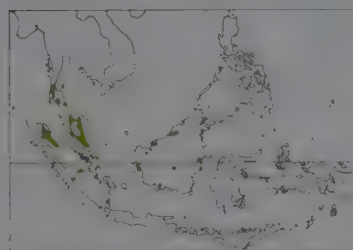
## 52. Black-throated Babbler

### *Stachyris nigricollis*

**French:** Timalie à gorge noire **German:** Schwarzkehl-Buschtimalie **Spanish:** Timali Gorginegro  
**Other common names:** Black-necked Babbler

**Taxonomy.** *Timalia nigricollis* Temminck, 1836, Borneo.  
Monotypic.

**Distribution.** S Thailand, Peninsular Malaysia, Sumatra and Borneo.



**Descriptive notes.** 15.5–16 cm; 18–31 g. Distinctive dark stout-billed babbler with rufous-chestnut upperparts and wings, black face and breast with white markings and dark grey belly. Lores and forehead are black, latter with fine white streaks, shading to dark olive-tinged grey on mid-crown to nape; short white postocular eyestripe, blackish-grey ear-coverts; upperparts dull rufous-chestnut (with fluffy lower back), upperwing and tail slate-grey with rufous-chestnut fringes; chin to breast black with narrow necklace of black-edged white feathers, broad but short white submoustachial streak; neck side and breast side to belly dark grey,

vent dark olive-chestnut; iris red, black eyelids; upper mandible black, lower mandible slaty with pale horn patch mid-way along; legs lead-grey to olive-black. Sexes similar. Juvenile is duller than adult, lacks white streaks on crown and white necklace, breast browner, underparts more sooty grey. **VOICE.** Song a repeated series of spaced, deliberate, monotonous, rather weak-sounding piping notes, the first couple stressed, "pu-pu-pu-pu-pu-pu" or "too-too-too-too-too..." and faster "pupupupupupupupupup"; frequently accompanied by low churring from mate; also more convoluted series of rapidly repeated hollow notes, "puwut-puwut-puwut-puwut", "pwut-pwut-pwut-pwut-pwut" and "chu-chuwu-chu-chu-chu-chu", etc. Calls include harsh slow rattled "tchrrrr-rrt" and "chrrrr-tchrrrrrrrrrr", harsh descending "ti-tu-chu-chu" or "chi-chi-chew-chew", and high "tchi-tchi".

**Habitat.** Undergrowth and edge of primary and secondary evergreen forest, selectively and heavily logged forest, freshwater swamp-forest and peatswamp-forest, sometimes tidal swamp-forest in Borneo, also overgrown rubber plantations, edges of overgrown tree plantations, *Albizia*, and oil-palm (*Elaeis*) plantation scrub; seems much more numerous in logged forest and reverting plantations; occasional in riverine swamp-forest, tall and stunted kerangas. Lowlands to c. 460 m in SE Asia; to 1400 m (but usually lower) in Sumatra.

**Food and Feeding.** Invertebrates, including beetles (Coleoptera). Typically forages in low vegetation, gleaning from foliage.

**Breeding.** May–Jul in SE Asia; Apr–Aug and juvenile also in Sept in Borneo. Nest a dome with loose canopy of dry leaves and flat, circular base, made of fibrous material (strips broader and coarser when on ground, shorter and finer when higher up), lined with slender strands of blackish fibre, placed on or close to ground among dense undergrowth. Clutch 2 eggs, pure white. Brood parasitism by Hodgson's Hawk-cuckoo (*Cuculus fugax*) reported. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Generally uncommon to fairly common in mainland range, but extinct in Singapore. Common in lowlands of Borneo in disturbed areas: present in Similajau National Park (Sarawak) and common in Tanjung Puting National Park (S Kalimantan). Presumed uncommon in Sumatra, where present in Gunung Leuser, Bukit Tigapuluh and Way Kambas National Parks; common in last-named, and common in heavily logged areas and rubber jungle in Bukit Tigapuluh. A Sundic lowland-forest species, thus highly susceptible to the extensive forest destruction (including severe loss of peatswamp-forest) that continues throughout its range, although use of submontane forest implies that it is not immediately at risk. Nonetheless, numbers decline in response to fragmentation of lowland-forest habitat.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth & Keish (1988), Duckworth *et al.* (1997), Johns (1989), Lambert & Collar (2002), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Nash & Nash (1988), Parroti & Andrew (1996), Robson (2000), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Darjono & Noor (1991).

## 53. White-necked Babbler

### *Stachyris leucotis*

**French:** Timalie oreillard **German:** Perhals-Buschtimalie **Spanish:** Timali Orejudo  
**Other common names:** White-eared Babbler/Tree-babbler

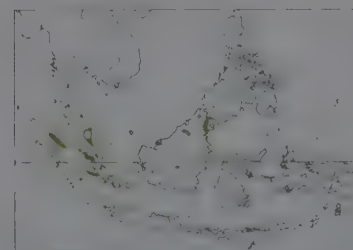
**Taxonomy.** *Timalia leucotis* Strickland, 1848, Malacca, Peninsular Malaysia.  
Three subspecies recognized.

**Subspecies and Distribution.**

*S. l. leucotis* (Strickland, 1848) – S Thailand and Peninsular Malaysia.

*S. l. sumatrensis* Chasen, 1939 – N & C Sumatra.

*S. l. obscurata* Mayr, 1942 – Borneo.



**Descriptive notes.** 14–15 cm; 26–29 g. Small, rather short-tailed, chunky babbler resembling *S. nigricollis*, but duller above, with fewer white markings and grey breast. Nominative race has crown greyish olive-brown, lores to area above eye buffy, continuing as (often broken) whitish supercilium breaking into white spots on black around rear of greyish ear-coverts; upperparts, including upperwing and tail, rufescent olive-brown, with bold pale rufous-buff tips on median and greater upperwing-coverts, tertials and secondaries; chin, submoustachial area and throat black, extending to join black behind ear-coverts, sharply demarcated from mid-grey underparts, sometimes with pale shaft streaks, browner on flanks and lower belly; undertail-coverts rufescent brown with broad buffy tips; iris brown to dark brown; upper mandible dark grey to black, lower mandible pale grey to plumbeous; legs olive-brown to light brown. Sexes similar. Juvenile is

On following pages: 54. Snowy-throated Babbler (*Stachyris oglei*); 55. Spot-necked Babbler (*Stachyris striolata*); 56. Grey-headed Babbler (*Stachyris poliocephala*); 57. Grey-throated Babbler (*Stachyris nigricollis*); 58. White-breasted Babbler (*Stachyris grammiceps*); 59. Crescent-chested Babbler (*Stachyris melanothorax*); 60. Chestnut-winged Babbler (*Stachyris erythroptera*); 61. Chestnut-rumped Babbler (*Stachyris maculata*).







**Food and Feeding.** Mainly insects, but only bush-crickets (Tettigoniidae) specified. Found in small single-species parties of up to 30 individuals (mean 11 on Mt Hahmun), but usual complement rarely exceeds six; commonly joins larger mixed flocks with strong representation of other



babblers, or associates with one other babbler species, e.g. *Macronus flavicollis* or *S. melanothorax*. Forages in undergrowth and middle stratum, typically at 3–5 m height, gleanings from leaves and vigorously probing decaying fronds and leaf tangles in relatively open understorey, sometimes hanging upside-down.

**Breeding.** Possibly in all months, but with peak in May–Jun (adults in body moult or full moult in Aug–Oct); fledging in Oct, and juveniles in Feb–Mar, Jul and Sept–Nov. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Java and Bali Forests EBA. Known from 19 sites, majority in W Java, with two in C Java and one in E Java. Patchily distributed but often common in appropriate habitat. In Gunung Halimun National Park (W Java), one of the commonest species in lowland forest in 1994, with densities as high as 4.3 birds/ha; relatively little such forest now remains, however, and species was uncommon to fairly common there in 2006. Appears to tolerate degree of forest disturbance: studies at Halimun suggest preference for areas with small-scale degradation and light-gaps, and more recent work implies possible adaptation to forest disturbance. Nevertheless, forest at low elevations in Java, including inside Gunung Halimun National Park, under considerable pressure. Recorded also in Ujung Kulon National Park and Gunung Gede-Pangrango National Park.

**Bibliography.** Anon. (1993, 2006d), van Balen *et al.* (2005), Butchari & Stattersfield (2004), Collar *et al.* (2001), Hoogerwerf (1950a, 1971), MacKinnon (1988), Nijman & van Balen (1998), Sodhi, Soh *et al.* (2005), Sody (1956), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Voous (1948).

## 59. Crescent-chested Babbler

### *Stachyris melanothorax*

**French:** Timalie perlée **German:** Perlwangen-Buschtimalie **Spanish:** Timali Perlado  
**Other common names:** Pearl-cheeked Babbler/Tree-babbler, Pearl-chested Babbler

**Taxonomy.** *Myiothera melanothorax* Temminck, 1823, Mount Gede (6°47' S, 106°59' E), west Java. Has sometimes been placed in genus *Macronus*. Plumage geographically variable, to greater extent than is reflected in current subspecific classification; on other hand, at least one authority prefers to merge *mendeni* and *albigula* with nominate. A further, undescribed race may exist on Bawean I, off NE Java. Five subspecies currently recognized.

#### **Subspecies and Distribution.**

- S. m. melanothorax* (Temminck, 1823) – W & C Java.
- S. m. mendeni* (Neumann, 1935) – Indramayu, in W Java.
- S. m. albigula* (Stresemann, 1930) – Mt Papandayan, in W Java.
- S. m. intermedia* (Robinson, 1918) – E Java.
- S. m. baliensis* (E. J. O. Hartert, 1915) – Bali.



**Descriptive notes.** 13 cm. Small, rather long-billed *Stachyris* babbler, ochrous-brown above, with rufous wings, pale below, with black crescent across breast. Nominative race has crown dull rufous-brown, nape to rump warm ochrous-brown, greater upperwing-coverts and primary coverts pale rufous-chestnut, primaries and secondaries edged paler rufous-chestnut, tail with rufous-chestnut tinge; side of face (lores, supercilium, ear-coverts, cheek) and neck side pale grey, blackish mark under ear-coverts; chin and throat creamy white, blackish crescent on upper breast, centre of breast creamy white, shading greyer below and to

buffish-ochre on belly, lower flanks, thighs and vent; iris brown; bill dark brown; legs brown. Sexes similar. Juvenile apparently undescribed. Race *albigula* is darker above than nominate, with paler grey ear-coverts and almost pure white throat; *mendeni* is colder olive-brown above, crown pale, throat as previous, grey on breast pale, and lower underparts with little buff-ochre tint; *baliensis* has throat light buff, breast rusty buff, slightly larger bill; *intermedia* is intermediate between nominate and previous, having mid-breast sandy buff and chin and throat white (not buff). **VOICE.** Song a quick rolling piping trill, "phr'r'r'r'r'r'r" or "puw'w'w'w'w'w" (recalling that of *S. erythroptera*), accompanied by harsh low churring calls (presumably from female), e.g. "tchrrrr't", "tr'r'r'r't" or "tchrrrr't".

**Habitat.** Dense thickets and thick scrub usually at forest edge, monsoon forest, wooded areas around villages; sea-level to 1500 m.

**Food and Feeding.** Spiders (Araneae) and insects. Forages in parties, occasionally associating with *S. thoracica* and *S. grammiceps*, and sometimes in bird waves. Uses feeding techniques typical of genus, such as investigating dead leaf tangles. Seen as high as c. 10 m in canopy.

**Breeding.** Recorded in all months except Jul (peak May–Jun in W Java). Nest a hollow dome with large side entrance near top, made of rattan, palm leaves, leaf ribs, rootlets, fibres and grass, placed close to ground. Clutch 2–3 eggs, white. Nests parasitized by Asian Drongo-cuckoo (*Surniculus lugubris*). No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Java and Bali Forests EBA. Generally common. Common in Gunung Gede-Pangrango National Park and present in Ujung Kulon National Park, both in W Java; present also in Alas Purwo National Park, in E Java.

**Bibliography.** Andrew (1985), Anon. (1993), van Balen (1992), Grantham (2000), Hoogerwerf (1947, 1950a, 1950b, 1971), Jany (1953), MacKinnon (1988), Nijman & van Balen (1998), Robinson & Kloss (1924a), Sody (1956), Stattersfield *et al.* (1998), Voous (1948).

## 60. Chestnut-winged Babbler

### *Stachyris erythroptera*

**French:** Timalie à ailes rouges **German:** Rotflügel-Buschtimalie **Spanish:** Timali Alirrojo  
**Other common names:** Red-winged Babbler/Tree-babbler

**Taxonomy.** [*Timalia*], *erythroptera* Blyth, 1842, Singapore.

Has sometimes been placed in genus *Macronus*. Five subspecies recognized.

#### **Subspecies and Distribution.**

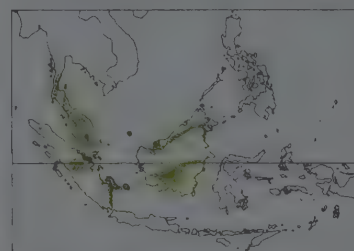
- S. e. erythroptera* (Blyth, 1842) – extreme S Myanmar (S Tenasserim) and S Thailand, Peninsular Malaysia, Singapore and N Natuna Is.

*S. e. pyrrhophaea* (Hartlaub, 1844) – Sumatra, including Batu Is, Bangka and Belitung.

*S. e. fulviventris* (Richmond, 1903) – Banyak Is, off NW Sumatra.

*S. e. bicolor* (Blyth, 1865) – N Borneo (including Banggi I).

*S. e. rufa* (Chasen & Kloss, 1927) – S Borneo.



**Descriptive notes.** 12.5–13.5 cm; 10–16 g. Small *Stachyris* babbler, dull chestnut above, greyish on face and underparts, with thin dark bill and bluish eyering. Nominative race has crown and upperparts dull ochrous chestnut-brown, face (forehead, lores, supercilium, cheek and ear-coverts), throat, breast and flanks dark dirty grey, shading paler on mid-breast and becoming dull greyish-buff on belly and vent; iris red (including broad blue to violet orbital skin (dark brown); bill dark blue-grey or blackish; legs pale grey to grey-green; when singing, shows blue, pale blue-green or violet bare neck skin. Sexes similar.

Juvenile is paler brown above and paler grey below than nominate. Race *pyrrhophaea* is darker grey from upper breast to vent; *fulviventris* is darker slate on breast and head side, darker grey-buff belly to vent; *bicolor* has dark grey crown and nape, and similarly grey anterior underparts; *rufa* has richer chestnut upperparts. **VOICE.** Song a soft, mellow, quite quick, piping but variable whistle of 7–10 notes, "hu-hu-hu-hu-hu-hu", occasionally a faster tremulous "hu hu'u'u'u'u'u'u" or slow "chu hu-hu-hu-hu"; may be accompanied by low "chrrr" notes (presumably from female). Calls with harsh scolding "trrrrr-trrrrr..." and soft "wip" and "wit" contact notes.

**Habitat.** Primary evergreen forest and tall secondary evergreen forest, selectively logged forest, bamboo brakes, upland heath, coastal peatswamp-forest, inland and tidal swamp-forest, and landward edge of mangroves; also tree plantations, including eucalypts (*Eucalyptus*), *Gmelina* and *Albizia*. To 800 m in Thailand and Sumatra, reaching 1220 m in N Borneo (Sabah).

**Food and Feeding.** Insects, including small beetles (Coleoptera), stick-insects (Phasmida), black ants (Formicidae), plant-bugs (Hemiptera), locusts; some fruits taken. Typically in small groups, methodically foliage-gleaning in middle storey, examining lower surfaces of twigs, probing angles between petioles and stems of understorey plants, probing within clusters of dead leaves, pulling up dangling vegetation to investigate with bill.

**Breeding.** Dec–Sept in SE Asia, and Mar–Jul and Oct–Nov in Borneo; probably multi-brooded. Partly a social breeder; nest built by both sexes, but observations of up to four birds building single nest. Nest a loose or quite compact dome with side entrance, made of dead bamboo or other leaves, dry grasses, leaf skeletons and twigs, caulked with moss, loosely lined with fine rootlets and fibres, placed 0.4–5 m above ground in tangled creepers, between creepers and sapling, or in sapling, thorny rattan or bush. Clutch 2–3 eggs, white or with faint bluish tinge, or (in Myanmar) spotted all over, mainly at larger end, with reddish. Brood parasitism by Asian Drongo-cuckoo (*Surniculus lugubris*) reported. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common in mainland range. Common in Khao Pra-Bang Kham Wildlife Sanctuary, in Thailand, and Taman Negara National Park, in Peninsular Malaysia. Common in high forest in Sumatra; common in lowland forests throughout Borneo, including Sabah. In Sumatra, present in Gunung Leuser, Bukit Tigapuluh and Way Kambas National Parks, being common in the last; recorded from the now destroyed Padang-Sugihan Wildlife Reserve, in S Sumatra. In Borneo, common in Danum Valley Conservation Area (Sabah), present in Similajau National Park (Sarawak), and common to very common in Tanjung Puting National Park (S Kalimantan).

**Bibliography.** Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Delgnan (1963), Duckworth & Kersh (1988), Duckworth *et al.* (1997), Fogden (1970), Gore (1968), Hopwood (1919), Hume & Davison (1878), Hume & Oates (1889), bin Jalan & Galdikas (1987), Johns (1989), Lambert (1992), Lekagul & Round (1991), Madoc (1956), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Nash, S.V. & Nash (1985a, 1988), Oberholser (1932), O'Brien & Kinnaird (1996), Parrott & Anderson (1996), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## 61. Chestnut-rumped Babbler

### *Stachyris maculata*

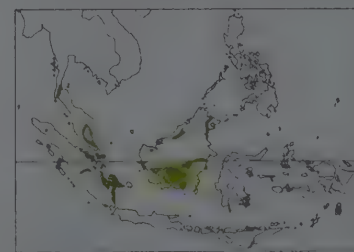
**French:** Timalie maculée **German:** Rostbüzel-Buschtimalie **Spanish:** Timali Maculado  
**Other common names:** Red-rumped Babbler

**Taxonomy.** *Timalia maculata* Temminck, 1836, Borneo.

Has sometimes been placed in genus *Macronus*. Three subspecies recognized.

#### **Subspecies and Distribution.**

- S. m. maculata* (Temminck, 1836) – S Thailand, Peninsular Malaysia, Riau Archipelago, Sumatra (including Bangka) and Borneo.
- S. m. banjakensis* Richmond, 1902 – Banyak Is, off NW Sumatra.
- S. m. hypopyrrha* Oberholser, 1912 – Batu Is, off W Sumatra.



**Descriptive notes.** 17–18.5 cm; 23–36 g. Relatively large, rather long-billed *Stachyris* babbler, dull olive-brown above with elongate chestnut rump plumes, dense black markings below. Nominative race has forehead to mid-crown olive-grey with vague blackish and narrow silvery streaking, shading to plain olive-brown on hindcrown to back and upperwing, dusky-chestnut lower back, rump and uppertail-coverts (all with elongate filoplumes); tail slightly browner than wings and with some chestnut fringes; lores to above eye blackish, submoustachial area, cheek and ear-coverts slightly shiny greyish-olive; chin and

throat blackish, breaking into broad blackish spotting on buffy-whitish breast to belly, flanks and vent dull grey-brown with ochre tinge, iris cream to orange-yellow (with darker outer rim, blue or purple orbital skin and retinal area; upper mandible black, lower mandible pale blue-grey to horn; legs grey or greenish-state to plumbeous, when singing, pale blue or turquoise-blue to pale green or bluish-green patches on neck side usually exposed. Sexes similar. Juvenile has brighter upperparts than adult, pale grey chin to breast, few black feathers on throat and foreneck, whitish central belly

**Breeding.** Mar–Sept in SE Asia, Mar–Apr in Sumatra, and Feb and May–Sept in Borneo. Nest a loose globe or cup, made of dry leaves, held together with a few bits of grass and roots, lined with thin layer of coarse grass-like material, placed 0.5–1 m above ground in centre of small palm or in tangle of creepers and dead leaves. Clutch 3 eggs, white or dull white; no information on incubation period; nestling period at least 10–11 days.

**Bibliography.** Anon. (2006), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Daniëlsens & Heegaard (1995), Deignan (1963), Duckworth & Kelsch (1988), Duckworth *et al.* (1997), Eames (2005), Holmes (1997), bin Jalen & Galdikas (1987), Johns (1989), Lambert & Collar (2002), Leksgul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Nash, A.D. & Nash (1985a), Nash, S.V. & Nash (1985a, 1988), Parrott & Andrew (1996), Rohson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Stattersfield & Capper (2001), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).









**Other common names:** Salvadori's Scimitar-babbler

**Taxonomy.** *Pomatorhinus erythrogenys* Vigors, 1832, "the district Simla-Almora", Himalayas, north India.

Forms *s* species group, and has commonly been treated as conspecific, with *P. maclellandi*, *P. gravivox*, *P. swinhoi* and *P. erythrocnemis*, all having similar plumage. Proposed race *haringtoni* (Himalayas from Sikkim E to Bhutan) merged with *ferrugilatus*. Four subspecies currently recognized.

### Subspecies and Distribution.

*P. e. erythrogenys* Vigors, 1832 – NE Pakistan (Murree Hills) E to N India (Uttaranchal Pradesh).

*P. e. ferrugilatus* Hodgson, 1836 – Nepal E to Bhutan.

*P. eimberhis* Salvadori, 1889 – E Myanmar.

*P. e. celatus* Deignan, 1941 - NW Thailand.

yellow; bill greyish or pale horn-brown, ivory-white base of lower mandible; legs flesh-brown to pale horn. Sexes similar. Juvenile has all rusty parts paler, and upperparts, edges of wings and wing-coverts have rusty wash. Race *ferrugilatus* is smaller than nominate, darker olive above, chin to upper breast dusky grey with whitish feather edges; *imberbis* is smaller than previous, like nominate in coloration but lores greyish, malar line weaker, breast with no "ghost" streaking, juvenile has most of underparts bright rufous and fading on abdomen to whitish; *celatus* is very like last, but lores darker grey, malar line absent, orange-rufous marginally paler, iris red. Voice. Song consists of short clear piping irregular phrases, very like that of *P. maclellandi* and most phrases more rushed, broken up and liquid-sounding, and presumed female notes much shorter, more staccato. Typical duets include "whi-u-ju-whi-u-...", "iu-chu-ip-iu-chu-...", and "yu-u-yi-yu-u-..."; also as a very quick, rich stuttering 3-note duetted "kvird'kup!", tumbling in pitch, and as similar but 1 noted "kvikuu", with first note much higher and shriller than final one (very like a song of *P. maclellandi*); also staccato, mellow "breer, b'dakwip!". Also a high clear ascending "pu" or "ju" followed by 3 or 4 higher well-spaced grating rattles, "jrr-jrr-jrr-jrr". When alarmed, gives rattling "whih-whihhhhh" and harsh "whit-it" or "whoi-whittittittit", the "whoi" note (recalling sound made by stone dropped in water) sometimes given singly.

**Habitat.** Thick scrub and dense undergrowth at forest edge, scrub in open pine forest, secondary growth, bramble thickets, dense overgrown nullahs, bush-covered and scrub-covered hillsides, bushes bordering fields, abandoned cultivation; in Bhutan reported particularly from scrub around villages. Found at 305–2400 m, occasionally to 3000 m, in Indian Subcontinent; 915–2000 m in SE Asia.

**Food and Feeding.** Insects, larvae, chrysalids, seeds and berries. Mostly in pairs in summer and in small parties of up to twelve individuals in winter (but such parties unreported in Bhutan); only occasionally joins bird waves. Spends most of time on ground among leaf litter, occasionally ascending trees in hoops.

**Breeding.** Feb-Jul: in tutan, calling individuals and duetting pairs occupy territories Mar–Sept. Nest, built by both sexes, a loose dome with broad entrance high up at side, or sometimes open at both ends, made of coarse grasses, dry fern, bamboo or other leaves, leaf stalks, plant fibres, moss roots etc., sparsely lined with fine grasses, fibres and rootlets, placed on ground, in depression, sheltered by brushwood, tree roots, ferns, grass, bush or rock, or sometimes 0.6–1.2 m above ground in thick bush. Clutch 2–4 eggs (usually 3 in India), white; incubated by both sexes; nestlings fed by both sexes; no information on duration of incubation and nestling periods.

**Status and Conservation.** Not assessed. Frequent but very local in Pakistan. Common and widespread in Nepal. Common and widespread throughout temperate zone and foothills of Bhutan; near Zhemgang, density of 2 territories/km of road at 1600–1900 m. Common in India, where seen intermittently in Rajaji National Park (Uttar Pradesh), common in Corbett National Park (Uttaranchal Pradesh), uncommon in Mahajatal Harsang Wildlife Sanctuary (Himachal Pradesh), fairly common in well-wooded areas of the New Forest campus at Dehra Dun, and in Dehra Dun valley (Uttaranchal), and present in Buxa Tiger Reserve (West Bengal). Common in Doi Inthanon National Park, in Thailand.

**Bibliography.** Ali & Ripley (1971), Ali *et al.* (1996), Allen *et al.* (1997), Bingham (1903), Collar (2006), Cook (1913), Deignan (1963), Gaston *et al.* (1994), Grimmer *et al.* (1998), Hume & Davison (1878), Hume & Oates (1889), Inskip & Inskip (1991), Inskip *et al.* (2000), Lekagui & Round (1991), Ludlow & Kinnear (1944), Martens & Eck (1995), Mishra (1997), Mohan (1997), Oates (1883, 1894), Pandey *et al.* (1994), Rasmussen & Anderton (2005), Rippon (1897), Robson (2000), Singh (2000), Smith *et al.* (1940, 1943), Smythies (1986), Snienberg (2005), Steinbacher (1967, 1969), Stevens (1923), Tvmstra (1993), Vaurie (1954b), Wickham (1929).

### 65. Spot-breasted Scimitar-babbler

*Pomatorhinus maclellandi*

**French:** Pomatorhin de McClelland **German:** Fleckenbrustsbler **Spanish:** Cimitarra Moteada  
**Other common names:** McClelland's Scimitar-babbler

**Taxonomy.** *P[omatorhinus]. McClellandi* Godwin-Austen, 1870, "at Nenglo beyond Asálu, under the Burraile range", Assam, India.

Forms a species group, and has commonly been treated as conspecific, with *P. erythrogeus*, *P. gravivox*, *P. swinhoei* and *P. erythrocnemis*, all having similar plumage. Monotypic.

**Descriptive notes.** 22 g, cm, 47.61 g. Smallish, semiarboreal, olive brown above and white below, with rufous ear-coverts and vent, and random ashy-olive blotchy spots on breast. Forehead is rufous-olive, shading to rufescent olive-brown on crown, upperparts, upperwing and tail; lores pale brownish. Ear-coverts dull rusty rufous, shading distally more olive, submoustachial line whitish with some pale olive flecking, malar long, narrow and black; chin to mid-belly white with irregular pale-olive blotch-like spots across breast and upper belly, flanks ochraceous-olive, thighs

mellow, often with higher, slightly falling "péék" note or, less often, harsher, burry downsurred "bréér" by second bird; also quick staccato "kerwick!", second note upturned, or similar "kerwérk!", second note only slightly higher. When alarmed, utters harsh rattle preceded by quick high notes, "wi-wi-chiitit"; also a rapid mechanical rattle preceded by loud frog-like sound, "whoip-tutututututut"

**Habitat.** Scrub-jungle and forest undergrowth, thickets in forest clearings, and abandoned cultivation, at 750–1830 m.

**Food and Feeding.** Insufficient information. Presumably as for *P. erythrogenys* and *P. gravivox*.  
**Breeding.** Mar-Jun. Nest a loose dome with side entrance, made of coarse grasses, dry fern, leaves, plant fibres, moss roots etc., sparsely lined with fine material, placed on ground or low in bush; like that of *P. erythrogenys*. Clutch 3-4 eggs, white. No other information.

**Movements.** Resident; reports of wandering to very low elevations in winter require substantiation.

**Status and Conservation.** Not assessed. Rare in E Bhutan. Current status in India uncertain; few recent records, but present in Ngangpui Wildlife Sanctuary (Mizoram). Presumably a rare resident in Bangladesh, where only one recent record. Common in W Myanmar, including in Natmataung National Park.

**Bibliography.** Ali & Ripley (1948, 1971), Birand & Pawar (2004), Collar (2006), Godwin-Austen (1870), Grime *et al.* (1998), Hopwood & Mackenzie (1917), Oates (1883), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Singh (1995), Smythes (1949, 1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thompson *et al.* (1993), Venning (1912), Wickham (1929).

## 66. Black-streaked Scimitar-babbler

*Pomatorhinus gravivox*

**French:** Pomatorhin chanteur    **German:** Schwarzstrichelsäbler    **Spanish:** Cimitarra Rayada

**Taxonomy.** *Pomatorhinus gravivox* David, 1873, southern Shaanxi, China.

Forms a species group, and has commonly been treated as conspecific, with *P. erythrogenys*, *P. maclellandi*, *P. swinhoi* and *P. erythrocnemis*, all having similar plumage. In China, proposed race *sowerbyi* (known only from type locality, 12 miles [c. 19 km] S of "Fushih", in N Shaanxi) treated as synonym of nominate and *stoneae* (from extreme NW Yunnan) merged with *dedekensi*. Five subspecies recognized.

### Subspecies and Distribution.

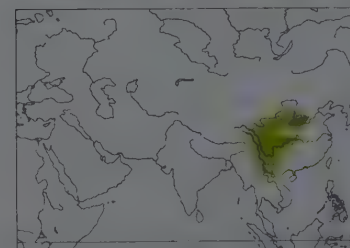
*P. g. gravivox* David, 1873 – NC China (S Gansu E to S Shanxi, S to N & NE Sichuan, W Henan and NW Hubei).

*P. g. cowensae* Deignan, 1952 – SC China (C & SE Sichuan, SW Hubei).

*P. g. dedekensi* Oustalet, 1892 – S China (SE Xizang, W Sichuan, extreme NW Yunnan).

*P. g. decarlei* Deignan, 1952 – S China (NW Yunnan and immediately adjacent parts of SW Sichuan and extreme SE Xizang).

*P. g. odicus* Bangs & Phillips, 1914 – NE & extreme E Myanmar, S China (Yunnan except NW, and SW Guizhou), N Laos and N Vietnam (Tonkin).



**Descriptive notes.** 21–25 cm; 46–79 g. Smallish to medium-sized scimitar-babbler, olive-brown above and white below, with rufous-tan ear-coverts, flanks and vent, and bold black streaking on breast. Nominate race has forehead and supercilium rusty rufous, crown and upperparts, including upwearing and tail, grey-washed olive-brown; lores greyish-white, ear-coverts dull rusty tan, submoustachial stripe whitish with blackish flecking, malar line blackish, very broad and relatively short, neck side to flanks buffy tan with greyish fringes; chin to belly white, breast with neatly aligned long blackish streaks, vent rufous-tan; iris

chestnut-red to brownish-grey, pale yellow or creamy white; bill grey, lower mandible sometimes yellowish or greenish basally; legs vary from leaden or flesh-brown to yellowish-green and reddish-yellow. Sexes similar. Juvenile is washed rufous-tan below, with very faint or no spotting on breast. Race *odius* is less grey, more olive, above than nominate, no rufous supercilium, mostly rufous submoustachial, richer rufous ear-coverts, richer and more extensive rufous on breast above and flanks, shorter and slightly sparser breast streaks; *decarlei* is very like previous, but slightly more olive-tinged above, rufous areas slightly duller; *dekekeni* is like last but a shade colder and greyer above, with slightly weaker, greyer breast streaks, *covensae* is like nominate but browner above, forehead more chestnut, ear-coverts more rufous, breast streaks blacker and more extensive, flanks dark cinnamon with olive suffusion. Voice. Evidently very similar to that of others in species complex, but no evidence yet of dust. In China, "whi-whup" or "whi-wru" from single bird in SE Xizang, and husky quick "whi-wip" recorded in N Sichuan; rapid-fire "whi'chu" or "whi'tu" from single bird in N Vietnam. Alarm calls "whoi-t't't't't", "whoiptut'ut'ut'ut'ut'ut" or "whup-which'ch'ch'ch'ch'".

**Habitat.** Open forest, forest edge, scrub-jungle, secondary growth in clearings, thickets, dry scrub (alang grass, abandoned cultivation, bamboo; at 1220–2600 m in SE Asia, but 200–3700 m in China and 3260–3800 m in summer in Xizang).

**Food and Feeding.** Insects and vegetable matter; raids cultivation for left-over rice, millet and taro. Found singly or in pairs. Forages on or near ground, rummaging among leaf litter.

**Breeding** Mar-Jun in China; multi-brooded. Nest an untidy dome with side entrance, made of grasses, bits of fern fronds, leaf skeletons, dry bamboo and other leaves, thin twigs and stalks, lined



low, black base of upper mandible; legs bluish-slate or greenish-slate to brownish. Sexes similar. Juvenile is duller and paler than adult, slightly browner above (but reported also as reddish-olive above), rufous on forehead, and rusty on breast and flanks. Race *leucogaster* is smaller than nominate, more olive-grey above, with slightly paler and less extensive chestnut on neck and body sides; *salimali* has blacker crown and ear-coverts; *cryptanthus* is very slightly more rufous-tinted above, slightly less grey on hindcrown, often more rufous on nape; *meursi* is somewhat slatter on upperparts, with blacker tail; *nuchalis* is slightly smaller and shorter-billed, crown concolorous with upperparts, variably broad or intense rufous extending around nape, and breast side and flanks mostly ochrous-grey with weak rufous-chestnut edges; *ripponi* is very like previous, but almost no trace of rufous on breast side and flanks; *difficilis* is like last two, but upperparts warmer, wings and uppertail dark ochraceous rufescent-brown; *olivaceus* resembles *nuchalis*, but crown and upperparts more olive-toned; *humilis* is similar to last but small (19–20 cm), and shorter-billed; *annamensis* is also similar but has darker crown demarcated from mantle, maroon-chestnut of nape and neck continuing down flanks; *klossi* has crown olive, upperparts somewhat more rufous-tinted. Voice. As with congeners, many songs are duets that sound as if by single bird. Song a series of usually 3–7 clear, quite fast hollow piping notes, e.g. "hu-hu-hu-hu-hu", "wu-hu-hu-hu-hu", "wu-hu-wu-wu-pu", "wu-hu-wu-wu-wu-wu-wu-wu-wu-wu-wu" or "whu-whu", sometimes with more abrupt, higher and more stressed first note or longer pause between first and second notes. May give faster "whuhuhuhuhuhu" or shorter "wu-hup" or "oo-hu" (perhaps by female), which may be combined in duets as "wu-hu-hu-wu-hu-wu-hup-wu-hu-hu-hu...". Calls include hoarse raspy syncopated gurgling, "weesh-wu-weeshweesh!", or 2-note version, second note higher, but same intoned rattle "Kurda-weesh-sh' sh-sh", when alarmed, harsh mocking "whihhihihi" and "whieniti", etc.; excited pairs give variety of mixed calls, including rather nasal, husky "whor-whor-whor", very nasal



"waaah" or "woieee", jumbled chattering mixed with quite high "who" notes, short clear "oh" and "whu" notes, and throaty "wuhu-wuhu" and "wuhu wuhu-wip".

**Habitat.** Dense undergrowth in deciduous and evergreen broadleaf forest, secondary growth, well-wooded ravines, mixed bamboo forest, scrub-jungle, and grassland; to 2650 m in India, 245–1500 m in Nepal, 400–1590 m in Bhutan, up to 2600 m in SE Asia.

**Food and Feeding.** Insects, also small seeds and berries. Found in pairs during breeding season; otherwise in small parties, joining mixed feeding flocks which often contain other scimitar-babblers and, in Bhutan, *Garrulax monileger* and *Garrulax pectoralis*. Forages on ground, hops in undergrowth and ascends trees.

**Breeding.** Nov.–Aug. Nest, built by both sexes over c. 10 days, a large, loose dome, usually on its side, entrance at smaller end or at side, made of dry bamboo or other leaves, coarse grasses, rootlets, twigs, strips of bark and bracken leaves, lined (often thickly) with thin strips of dry bark, bark fibres, fine grasses, shredded dry bamboo leaves and rootlets, placed low down in bamboo clump or thick bush, grass clump, bank at foot of tree, or buried among dry leaves on ground, in depression on ground or at foot of small screw pine (*Pandanus*), up to 1 m above ground. Clutch 2–5 eggs (usually 3–4 in India and Myanmar), white; incubation by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Frequent in Nepal up to 915 m, then rare to 1500 m. Local but frequently recorded in Bhutan. In India, fairly common in W Himalayas up to 1500 m, becoming locally common in E up to 2000 m; fairly common in Kalesar Wildlife Sanctuary (Haryana), rare on New Forest campus at Dehra Dun and uncommon in Dehra Dun valley (Uttaranchal); common in Nameri National Park and uncommon in Kaziranga National Park (Assam), and present elsewhere in NE India in (at least) Buxa Tiger Reserve (West Bengal), Eaglenest Wildlife Sanctuary and Mouling National Park (Arunachal Pradesh) and Balphakram National Park (Meghalaya). Generally fairly common to common in SE Asian range. Common in Khao Yai and Kaeng Krachan National Parks, in Thailand. Common (at least before 1970) at Bokor and in Cardomom Mts. in Cambodia. Occasional in Xe Pian National Biodiversity Conservation Area (NBCA), Phou Xang He NBCA, Dong Hua Sao NBCA and Phou Dendin NBCA, in Laos, and present in Phou Khaokhoay, Nakai-Nam Theun and Hin Namno NBCAs. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam), and in five protected areas in the Annamese lowlands, although scarce in Nam Bai Cat Tien National Park (Cochinchina).

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Bingham (1903), Birand & Pawar (2004), Chasen (1939), Choudhury (2003), Collar (2006), Cook (1913), David-Beaulieu (1932, 1939, 1944, 1950), Davidson *et al.* (1997), Deignan (1942, 1963), Delacour & Jabouille (1931a), Dickinson (1970), Duckworth *et al.* (1998), Eames (1995), Eames, Eve & Tordoff (2001), Eames, Steinheimer & Ros Bansok (2002), Engelbach (1932), Evans & Timmins (1998), Garthwaite & Ticehurst (1937), Godwin-Austen (1870), Grimmett *et al.* (1998), Hopwood (1912, 1919), Hopwood & Mackenzie (1917), Hume (1877, 1880), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Kalsi (1998), Katti *et al.* (1992), King *et al.* (2001), Lê Xuân Canh *et al.* (1997), Lekagul & Round (1991), Ludlow & Kinnear (1944), Mayr (1938), Medway & Wells (1976), Mohan (1997), Neath (2001), Oates (1883), Rasmussen & Anderton (2005), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Round (1998), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Singh, A.P. (2000), Singh, P. (1995), Smith *et al.* (1940, 1943), Smythies (1986), Spierenburg (2005), Stanford & Ticehurst (1930), Stevens (1923), Stressemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Thomas & Poole (2003), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Wickham (1929), Wiles (1980).

## 70. Indian Scimitar-babbler

### *Pomatorhinus horsfieldii*

**French:** Pomatorhin de Horsfield **German:** Horsfieldsäbler **Spanish:** Cimitarra India  
**Other common names:** Deccan/peninsular Scimitar-babbler

**Taxonomy.** *Pomatorhinus horsfieldii* Sykes, 1832, the Deccan [= Mahabaleshwar, Satara North], India. Has been treated as conspecific with *P. schisticeps* and *P. melanurus*; vocalizations extremely like those of former (from which differs only in lack of rufous on plumage), and perhaps better treated as conspecific; further field study needed. Four subspecies recognized.

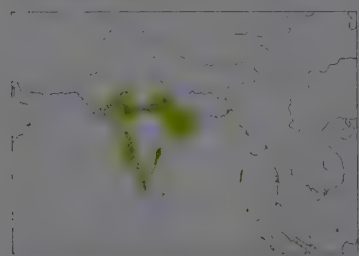
**Subspecies and Distribution.**

*P. h. obscurus* Hume, 1872 – W India (SW Rajasthan S to S Gujarat and SW Madhya Pradesh).

*P. h. horsfieldii* Sykes, 1832 – SE Gujarat S to Goa and NW Karnataka, and E to C Madhya Pradesh, Orissa and NE Andhra Pradesh.

*P. h. travancorensis* Harington, 1914 – Goa S to Kerala and W Tamil Nadu.

*P. h. maderaspatensis* Whistler, 1936 – C & S Andhra Pradesh and N Tamil Nadu.



similar. Juvenile lacks black lateral crownstreaks, has upperparts more golden olive-brown, white feathers of lower throat with faint black tips, lower underparts washed and mottled with rufous. Race *obscurus* is paler, more smoky grey, than nominate, with neck and breast sides concolorous with upperparts; *maderaspatensis* is like previous, but more olive-toned on upperparts and flanks; *travancorensis* is richer olive-brown above. Voice. Flock-members and pair-members keep in touch by yellow bubbling or gurgling calls and song duets, the combined sound seeming to be given by one bird. Songs include variety of low, mellow, hollow-sounding series of hoots or "bouncing-bari" series starting with a note, presumed female joining (if at all) mid-way or at end, usually with higher-pitched "gu-tork!", commonest songs consist of 3–5 slow mellow hoots, often with either bird's "gu-tork!" presumed, alternating males may alternately give same song type, becoming more guttural when agitated, hoots may be all on same pitch and at even tempo, or first may be higher (or lower) and offset. Male *travancorensis* gives musical, flute-like "woi-no-ho-ho", "oo-pu-pu" or "oo-pu-pu-pu", this immediately followed by female's subdued "kraku" or "krakam". Also described as a mellow, lute "oo-pu-pu-pu-pu". Bouncing-bari song much as that of *schisticeps*, but slower and usually slightly decelerating; intermediate songs similar but shorter

and faster, or longer and notes more hooting. Calls include a variety of chirps and rattles uttered while feeding or when suspicious; quick hoarse hoots running into short, higher-pitched, ascending guttural rattles; "pop pop-prrr"; a deep guttural "woch-wohoro"; and a sharp "kir-r-r-r" in alarm.

**Habitat.** Deciduous, moist deciduous, semi-evergreen and evergreen forest, cardamom sholas, bamboo and *Strobilanthus* patches, thorn and lantana scrub, and dense bush-jungle; at 915–2135, locally to 2400 m.

**Food and Feeding.** Insects, grubs, spiders (Araneae); also berries and flower nectar. Found in pairs during breeding season, otherwise in small parties of 4–10 individuals; often in association with mixed feeding parties. Forages on ground under dense undergrowth, flicking aside or turning over leaves or digging vigorously in mulch. Also hops along moss-covered branches or up trunks of trees.

**Breeding.** Oct–Jun throughout range. Nest, built by both sexes, described as a loose, often large, dome, with entrance on upper side, or a semi-domed cup, made of dead or decaying leaves, dry grasses, moss and moss roots, plant stems, grass roots, rootlets and fibrous bark strips, lined with fine grasses, moss roots, rootlets and dead leaves, placed on ground among dead leaves or moss, in or at base of bush or shrub, in clump of ferns or grass, in recess in trailside bank, on rock ledge or in crevice or hollow in tree trunk, usually 0.3–0.6 m above ground, exceptionally to 1.8 m. Clutch 2–5 eggs (usually 4–5), white; no information on duration of incubation and nestling periods; nestlings fed by both sexes.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Locally common in peninsular hills; fairly common in Bandhavgarh National Park, in Madhya Pradesh, and present in Mudumalai National Park, in Tamil Nadu.

**Bibliography.** Ali (1942, 1955), Ali & Abdullali (1936), Ali & Ripley (1971), Collar (2006), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Hume & Oates (1889), Kotagama & Goodale (2004), Rasmussen & Anderton (2005), Whistler & Kinnear (1932), Zacharias & Gaston (1993).

## 71. Sri Lankan Scimitar-babbler

### *Pomatorhinus melanurus*

**French:** Pomatorhin de Ceylan **German:** Schwarzschanzäbler **Spanish:** Cimitarra Cingalesa

**Taxonomy.** *Pomatorhinus melanurus* Blyth, 1847, Urugaha, south of Kalutara, Western Province, Sri Lanka.

Has been treated as conspecific with *P. horsfieldii* and sometimes also *P. schisticeps*. Two subspecies recognized.

**Subspecies and Distribution.**

*P. m. melanurus* Blyth, 1847 – W part of SC Sri Lanka (wet lowlands and W hills).

*P. m. holdsworthi* Whistler, 1942 – E part of SC Sri Lanka (dry lowlands and E hills).



**Descriptive notes.** 19–21 cm. Nominative race has forehead blackish, shading to dark greyish-brown on crown and to dark rufescent brown on upperparts, with dull greyish-brown upperwing and tail; bold white supercilium from bill base above blackish lores to upper neck side; cheek and ear-coverts blackish, shading to rufescent brown neck side; chin and submoustachial area to belly white, flanks and thighs dark rufescent brown, lower belly dull greyish or greyish-white; iris brownish-red or dull red; bill yellow, darker around nares; legs greyish-blue to yellowish-brown. Differs from similar *P. horsfieldii* in smaller size, yellower

and shorter bill, proportionately much shorter tail, weaker (black) lateral crownstreaks, much richer rufescent brown upperparts, richer rufescent flanks. Sexes similar. Juvenile has greyer head, less white on underparts, more rufous on upperparts, breast side and flanks, and straighter bill. Race *holdsworthi* is less rufescent, more yellowish, above and on flanks than nominate. Voice. Vocalizations differ distinctly from those of *P. horsfieldii*, being higher-pitched, with more melodious and less hollow-sounding notes; an "oop-ooop-ooop-ooop..." and sonorous, pleasant "pawp-pawp" answered presumably by female with "kaa-kree, kaa-kree"; also descending "do do do do", "pop pop-prrr" and deep "woch wohoro". Call of male with family party "twoi twoi twoi"; dependent young give plaintive mewling when solicited food.

**Habitat.** Shady forests and woods, particularly near streams, also bamboo stands, low jungle and thick cover; sea-level to 2100 m.

**Food and Feeding.** Presumed to feed on invertebrates. Forages on ground, low branches and vertical trunks and on large limbs of trees, working its way upwards in fashion of a woodpecker (Picidae).

**Breeding.** Dec–Feb. Nest untidy, usually made of moss, grass roots, fibres and dead leaves, placed in tree crevice between projecting piece of bark and trunk, sometimes on rock ledge. Clutch 3–5 eggs, pure white. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common and widely distributed in lowlands and hills, but more abundant in latter. Common in Sinharaja Forest Reserve; uncommon to common in Horton Plains National Park.

**Bibliography.** Collar (2006), Grimmett *et al.* (1998), Harrison (1999), Henry (1998), Kotagama & Fernando (1994), Legge (1880), Phillips (1978), Rasmussen & Anderton (2005), Ripley (1946), Wait (1925), Whistler (1944).

## 72. Chestnut-backed Scimitar-babbler

### *Pomatorhinus montanus*

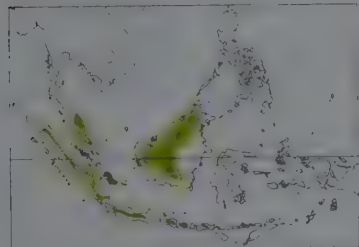
**French:** Pomatorhin à dos marron **German:** Rotrückensäbler **Spanish:** Cimitarra Dorsicastaña  
**Other common names:** Yellow-billed Scimitar-babbler

**Taxonomy.** *Pomatorhinus montanus* Horsfield, 1821, Mount Merbabu and Mount Prah, central Java. May be close to *P. schisticeps*. Races *occidentalis* and *bornensis* smaller and brighter than Javan ones, and study of differences, including vocal ones, required; situation further complicated, however, by evidence that in Java and Sumatra, at least, upland birds are precocious, flocking and noisy, whereas lowland populations in Sumatra, Borneo and Peninsular Malaysia are skulking, unsociable and thought possibly to produce only the triple hooting call. Further research needed. Four subspecies recognized.



**Subspecies and Distribution.**

*P. m. occidentalis* Robinson & Kloss, 1923 – extreme S Thailand, Peninsular Malaysia and Sumatra.  
*P. m. bornensis* Cabanis, 1851 – Bangka I and Borneo.  
*P. m. montanus* Horsfield, 1821 – W & C Java.  
*P. m. otolanderi* Robinson, 1918 – E Java and Bali.



**Descriptive notes.** 19–21 cm. Small scimitar-babbler with relatively short decurved bill, grey-crowned and black-faced with white supercilium, rich chestnut upperparts and flanks, white underparts. Nominate race has crown slaty grey, switching on nape to rich rufous-chestnut upperparts, neck side and flanks, upperwing fringed slightly browner, tail chestnut-tinged dark brown; weak white supercilium from above nares; lores, cheek and ear-coverts blackish or blackish-grey, chin and submoustachial area to mid-belly white, thighs dark grey, vent dull ochrous-chestnut; iris dull or pale yellow to pale brown; bill yellow to

horn, basal half of upper mandible black; legs greenish-slate to pale slaty blue. Sexes similar. Juvenile is duller than adult, rufous parts of plumage paler and rufous less extensive on flanks, ear-coverts mostly chestnut, forehead with rufous fringe, crown washed rufous. Race *otolanderi* is like nominate but supercilium only postocular; *occidentalis* has slightly more olive-grey crown, always full-length (i.e. preocular as well as postocular) and bolder white supercilium, bright rufous-chestnut back and flanks, greyer-edged flight-feathers, shorter tail; *bornensis* is like last, but wings and tail blacker. **VOICE.** Songs in N Borneo (Sabah) and Bali similar, a quickish “wu-pwi” given 3–5 times in series, with immediate response from second bird “wu-pu’ pu’ pu’ pu’ pu’ pu’”, also a throaty, husky “whor-wup”; in Java a very quick, quite grating “hu’wi” or “wihu’wi” repeated in series, while second bird gives repeated, monotonous, lower-pitched “wupup-wupup-wupup-wupup”. In Java, alarm a rather harsh “whit’it’it’it’it’it’” or “whip’ip’ip’ip’ip’ip’ip’”.

**Habitat.** Undergrowth and grass in primary lowland, submontane and lower montane broadleaf evergreen forest, secondary and disturbed forest, lightly logged forest, pure bamboo stands, overgrown clearings, occasionally in *Albizia* plantations; to 1370 m in Peninsular Malaysia, to 1200 m in Sumatra, 1400–2000 m in Java, and 500–2800 m in Borneo.

**Food and Feeding.** Beetles (Coleoptera), crickets and grasshoppers (Orthoptera), cicadas (Cicadidae), earwigs (Dermaptera), caterpillars, grubs, also spiders (Araneae); also ginger seeds, flower pods, fruit and berries. Found singly, in pairs, or in small parties, often associating with other species in bird waves, particularly *Garrulax rufifrons* in Java. Usually forages in undergrowth and lower middle storey, sometimes ascending to middle storey and even canopy; gleans items from foliage and bark, concentrating on epiphyte-covered trunks and large boughs.

**Breeding.** Apr–Jun and Nov–Dec in Malay Peninsula, in all months except Mar and Oct (but mainly May–Jun) in Java, and Oct–Feb in Borneo; possibly multi-brooded. Nest a large dome or sheltered cup, made of coarse grasses, loosely linked pieces of padi, fern fronds, stems decorated with moss, large grass leaves or old leaves and grasses, lined with finer leaves or grass stems, placed in grassy undergrowth or scrub and grass at edge of grassland or on bank face. Clutch 2–5 eggs (2–3 in Borneo), white, but those in one Borneo nest described as irregularly marked with reddish-brown. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common in Peninsular Malaysia. In Borneo, uncommon in Sabah; present in Similajau National Park (Sarawak) and Gunung Niut Nature Reserve (W Kalimantan). In Sumatra, common in primary and disturbed habitats, and present in Gunung Leuser, Bukit Tigapuluh and Way Kambas National Parks, being scarce in last. Common in Gunung Gede-Pangrango National Park, in W Java.

**Bibliography.** Andrew (1985), Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Davison (1997a), Duckworth & Kelsch (1988), Duckworth *et al.* (1997), Holmes (1996), Holmes & Burton (1987), Johns (1989), MacKinnon (1988), Madoc (1956), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), O’Brien & Kinnaird (1996), Parrott & Andrew (1996), Priem & Heegaard (1988), Rinke & Jensen (2000), Robinson (1928), Robinson & Kloss (1923), Robson (2000), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Sody (1956), Thompson (1966), Voous (1948), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 73. Streak-breasted Scimitar-babbler

### *Pomatorhinus ruficollis*

**French:** Pomatorhin à col roux **German:** Rothalsäbler **Spanish:** Cimitarra Cuellirrufo  
**Other common names:** Rufous-necked Scimitar-babbler; Nepal Rufous-necked Scimitar-babbler (Himalayas)

**Taxonomy.** [*Pomatorhinus*] *Ruficollis* Hodgson, 1836, Nepal.

Closely related to *P. musicus* and formerly treated as conspecific. In C Laos (Nam Theun watershed), population of scimitar-babblers exhibits signs of intergradation between present species (race *beaulieu*) and *P. schisticeps*, such that attribution to one species or the other has proved problematic, hence triggering opinion that the two species may be conspecific; in Himalayas and upper Myanmar, however, the two occur alongside one another and behave as separate species; more work needed. Birds in SC China (SE Sichuan S to N Guangxi and W Hunan) formerly treated as race *intermedius*, but latter name invalid, as preoccupied; replaced by new name *hunanensis*. Nominate race intergrades with *godwini* in E Nepal. Contrary to some recent opinions, *styan* appears to be a valid race, although considerable intermediacy among races suggests much clinal variation. Other named races are *bhamoensis* (from Bhamo area, in NE Myanmar), synonymized with *similis*, and *usheri* (C Sichuan, in SC China), synonymized with *eidos*. Thirteen subspecies currently recognized.

**Subspecies and Distribution.**

*P. r. ruficollis* Hodgson, 1836 – N India (E Uttaranchal Pradesh) E to EC Nepal.  
*P. r. godwini* Kinnear, 1944 – EC Nepal E to NF India (Arunachal Pradesh) and adjacent S China (SE Xizang).  
*P. r. bakeri* Harington, 1914 – NE Indian hill states (S of R Brahmaputra), SI, Bangladesh and W Myanmar.  
*P. r. similis* Rothschild, 1926 – N Myanmar and S China (NW & W Yunnan E to SW Sichuan).  
*P. r. spodiops* Seeborn, 1884 – F China (S Gansu and N & NE Sichuan) to S Hunan and N Zhejiang.  
*P. r. eido* Yang, 1930 – SC China (C Sichuan and adjacent extreme N Yunnan).  
*P. r. laurenti* La Touche, 1921 – Künming area of C Yunnan (SC China).  
*P. r. alpinus* La Touche, 1923 – SC China (SW Yunnan) and extreme S Laos.

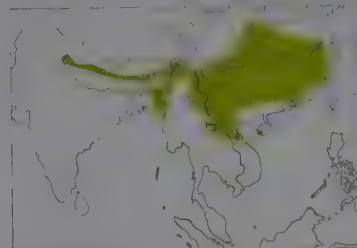
*P. r. beaulieu* Delacour & Greenway, 1940 – N & C Laos.

*P. r. reconditus* Bangs & Phillips, 1914 – S China (SE Yunnan, SW Guangxi) and N Vietnam (Tonkin, N Annam).

*P. r. hunanensis* Cheng Tsohsin, 1974 – SE China (SE Sichuan and Guizhou E to W Hunan and N Guangxi).

*P. r. stridulus* Swinhoe, 1861 – SE China (F Hunan and Guangdong E to S Zhejiang and Fujian).

*P. r. nigrostellatus* Swinhoe, 1870 – Hainan I.



**Descriptive notes.** 16–19 cm; 19–39 g. Small scimitar-babbler, warm brown above with rufous-chestnut nape and neck side, pale supercilium, black mask and broad breast streaks; bill shorter and less decurved than that of congeners. Nominate race has crown dull ochrous-brown, clear-cutting to dull rufous-chestnut nape and upper mantle, shading to warm ochrous olive-brown on remaining upperparts, upwiping and tail; long broad supercilium white, lores, cheek and ear-coverts black but lower ear-coverts with some white streaks, neck side below end of supercilium and behind ear-coverts rufous-chestnut; chin,

submoustachial area and throat white, breast and mid-belly white with long broad dull ochrous-olive streaks, flanks, lower belly, thighs and vent dull grey-tinged ochrous-olive; iris pale red to crimson-brown or dark brown; upper mandible black with yellow tip, lower mandible yellow to yellowish-white; legs greenish-grey or yellowish-plumbeous to brown. Sexes similar. Juvenile is more rufous above than adult, with white throat and plain rufous-chestnut breast. Race *godwini* has darker crown and more rufescent upperparts than nominate, streaking below duller; *bakeri* has paler, weaker underpart streaking, slightly paler and colder upperparts, usually yellow eyes, mostly yellow bill; *similis* is very like nominate but ear-coverts browner, bill almost all yellow (only extreme base of upper mandible dark); *laurenti* is like previous, but has pinkish bill, more rufous-washed upperparts, purer greyish underparts, bill shorter; *alpinus* has greatly reduced breast streaking (leaving breast very white), flanks olive-brown, bill relatively long, only base of upper mandible blackish; *beaulieu* is very like last, but greyer on crown and flanks; *reconditus* is like nominate, but breast streaks pale rufous-chestnut, flanks more rufous, upperparts richer, and rufous-chestnut on nape and upper mantle broader and stronger; *eidos* is like nominate, but breast streaks slightly browner, rufous-chestnut of neck deeper, upperparts richer; *styan* is smaller than previous, and with greyer-tinged breast streaks; *stridulus* is like last in size but bill a little stouter, colour richer above, and with streaking and lower underparts rich rufous-chestnut (closely resembles smaller version of *reconditus*); *hunanensis* is small, with dark brown breast streaks, rufous neck patch; *nigrostellatus* has darker chestnut neck side with colour extending to flanks, breast streaks maroon-brown and dense but with frayed white fringes (creating scalier appearance when plumage fresh). **VOICE.** Song in SE Asia a loud, clear, rather high piping “u-hu-hu”, “wu-wu-wu”, “wu-wee-wu” and similar, uttered quite quickly; sometimes slower “wu-wu” or fuller-sounding “whu-whi” or “u-whi wi”; elsewhere described as quick, mellow whistle of 3 (occasionally 2 or even up to 10) short notes, “win-wun-wun”, first note higher or lower in pitch (like one song type of *P. schisticeps* but higher-pitched, first note higher or lower and more slurred, all notes more liquid). Contact call a loud, bright, raspy, strident uplurred “wreep”, given usually in ones, twos or threes, and often ending with harsh higher rolled gurgle, e.g. “wreep-wreepwreep’s’s’s’h”; when alarmed, harsh scolding rattles, e.g. “whi-whi-whi whi-whi-whi-whi-whi”, “chrrurururur”, “whi-wi chutututut”, “chutututut”, “whi-wi-irritirrit”.

**Habitat.** Dense scrub on hillsides, dense undergrowth in open forest, open bamboo-jungle, rhododendron shrubs, brambles, bracken, tea gardens and nearby jungle edge, thickets, hedges, cogon grass (*Imperata*). In Bhutan, found more in forest at lower elevations, where overlaps with *P. erythrogenys*; at higher elevations uses scrub and open conifer forest. Found at 1370–3050 m (locally 700–3300 m) in Indian Subcontinent, 915–2440 m in SE Asia; 1600–2775 m in Xizang, and 200–3400 m in rest of China.

**Food and Feeding.** Insects, including cicadas (Cicadidae), beetles (Coleoptera), ants (Formicidae), larvae and grubs; also seeds and berries. Shy. Usually in pairs, particularly during breeding season; otherwise in small parties of up to six individuals, sometimes in company with other species in mixed flocks. Usually forages near ground. Climbs about tree trunks; occasionally hangs upside-down, like woodpecker (Picidae) or nuthatch (Sittidae), on underside of moss-covered branch.

**Breeding.** Jan–Jul; multi-brooded. Nest a bulky, crude dome with entrance at side or near top, or a cone on its side, made of dry bamboo or other leaves, fern leaves, grasses, strips of bark, twigs, plant fibres, stems and roots, lined with rootlets, grasses, leaf skeletons, moss, stalks and fine fibres, placed on ground among grass, ferns or dead leaves, in recess in bank or on ledge, sometimes low down in small tree, bush or grass, rarely above 1 m. Clutch 2–5 eggs (usually 4 in India), white. No other information.

**Movements.** Resident; reported as winter visitor in Nagaland (NE India), but this improbable.

**Status and Conservation.** Not globally threatened. Fairly common in Nepal. Common and widespread at middle elevations in temperate zone in Bhutan. In India, locally common in W Himalayas, fairly common in E Himalayas, and locally common in NE hills; present in Buxa Tiger Reserve (West Bengal) and in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh), and in Barail Reserve Forest (Assam). Common in Natmataung National Park, in Myanmar. Abundant in parts of China, common at Emei Shan Protected Scenic Area (Sichuan), common in Shiwandashan National Nature Reserve and Diding Nature Reserve (Guangxi), and common in areas of Guangdong adjacent to Hong Kong; uncommon and localized population in Hong Kong of captive origin. Uncommon to common in SE Asian range. Present in Phou Dendin and Nakai-Nam Theun National Biodiversity Conservation Areas, in Laos. In Vietnam, present in Na Hang Nature Reserve and fairly common in Tam Dao National Park (in N), and in six protected areas in the Annamese lowlands.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Birand & Pawar (2004), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paulai (1960, 1962), Cheng Tsohsin *et al.* (1963), Choudhury (2001, 2003), Colias (2006), Collias *et al.* (2003), David-Beaulieu (1944), Dedmon (1987), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Duckworth *et al.* (1998), Eames *et al.* (2001), Evans & Timmins (1998), Gasson (1989), Gidwan, Austen (1974), Grimmett *et al.* (1998), Hachisaka & Saitoh (1976, 1981), Hill (2000), Hopwood & Mackenzie (1917), Huang Qiang, Deng Hei & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Hei (1993), Ilupke & Bates (1889), Inskip & Inskip (1997), Inskip *et al.* (2006), Kinnear & Kinnear (2001), King (1987, 1989a, 1989b, 1989c), King & Han Lianxian (1991), King & Liao Weiping (1989), King & Zheng Guangmei (1988), S. Major (1979), Koelz (1954), Koenig *et al.* (2004), La Touche (1921), La Touche & Lee Kwok-ting *et al.* (2000), Lewis (1940), Lewis & Silliman (1940), Li (1979), Li & Cheng (1993), Li & Li (1993), Luo Jiaze *et al.* (1994), Li Guoyun, Zhang Qingmao & Wen Anxiang (1993), Liu Kezhi *et al.* (1994), Ludlow (1951), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderson (2005), Ripley (1926), Ripley (1952), Robbins *et al.* (2006), Robson (1986, 2000), Robson, Fames, Nguyễn Cu & Truong Van La (1993a), Robson, Fames, Wolstencroft *et al.* (1989), Round (1999), Singh (1995), Smythies



(1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stresemann & Heinrich (1940a), Thet Zaw Naing (2003), Tymstra (1993), Venning (1912), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang, Lin Qiwei *et al.* (1986), Wu Zhikang, Yang Jiongli & Xu Weishu (1981), Yen Kwokying (1934a, 1934b), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zhao Xiubi (1994), Zheng Baolai (1988), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983), Zhu Xi & Fan Houde (1995).

## 74. Taiwan Scimitar-babbler

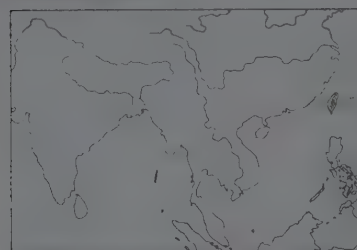
### *Pomatorhinus musicus*

**French:** Pomatorhin de Taiwan **German:** Taiwansäbler **Spanish:** Cimitarra de Formosa  
**Other common names:** Lesser Scimitar-babbler

**Taxonomy.** *Pomatorhinus* [sic] *musicus* Swinhoe, 1859, Taiwan.

Closely related to *P. ruficollis* and formerly treated as conspecific. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 19–21 cm; mean 40 g. Crown and nape are brown-tinged slaty grey with narrow white streaks on forehead, cutting sharply to rufous-chestnut mantle and neck sides (forming broad collar); remaining upperparts and upperwing mid-brown, greyish-brown tail; white supercilium from bill base above lores extending into upper edge of rufous collar; lores, cheek and ear-coverts black; chin, submoustachial area, throat and breast white, breast with evenly distributed large, broad black streaks, these changing colour on upper belly to chestnut on white; upper flanks and mid-belly chestnut, becoming dirtier and lower belly to brownish. Differs from similar *P. ruficollis* in somewhat larger size, proportionately longer bill with all-dark upper mandible, dark greyish crown, much broader and richer chestnut hindcollar, breast streaks brownish-black with clean-cut ovate pattern, and strongly chestnut-washed belly and lower flanks. Sexes similar. Juvenile apparently undescribed. Voice. Song variable, including rather husky “wuh-wuh-wuh-wree”, repeated every 5–9 seconds, quickly answered by jollier “wu-wit” (second note rising), also a hollow piping “uh-pu-pu-pu” (sometimes more hurried “wup’u’wu”) answered by low harsh husky “whéér-wu’wu”. Call (in Oct) a loud, rich, musical “tui-tui”, repeated fairly regularly at intervals; also a whistled, burry “jrr-jee”, second note rising.

**Habitat.** Inhabits undergrowth of foothill, submontane and montane forest in the *Ficus*–*Malilus*, *Malilus*–*Castanopsis* and *Quercus* zones, up to 2300 m; in N Taiwan, elevational limits are 15–2040 m.

**Food and Feeding.** Insects and seeds found in stomachs. Behaviour as in *P. ruficollis*. Usually in pairs during breeding season; also in small parties at other times. Usually forages near ground or around tree trunks.

**Breeding.** Apr–Jun. Clutch 3 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common. Recorded density of 0.03 birds/ha in mixed coniferous forest in Yushan National Park, although this not a preferred habitat.

**Bibliography.** Cheng Tsohsin (1987), Collar (2004, 2006), Collar *et al.* (2003), Ding Tsungsu *et al.* (1997), Hachisuka & Udagawa (1950, 1951), Koh Chaonien & Lee Peifen (2003), Kuroda (1917), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Yen Chungwei (1990).

## 75. Orange-billed Scimitar-babbler

### *Pomatorhinus ochraceiceps*

**French:** Pomatorhin à bec rouge **German:** Rotschnabelsäbler **Spanish:** Cimitarra Piquirroja  
**Other common names:** Red-billed/Long-billed Scimitar-babbler, Lloyd’s Scimitar-babbler, Ochraceous-headed Scimitar-babbler

**Taxonomy.** *Pomatorhinus ochraceiceps* Walden, 1873, Karen Hills, Upper Myanmar.

Four subspecies recognized.

**Subspecies and Distribution.**

*P. o. stenorhynchus* Godwin-Austen, 1877 – extreme NE India (E Arunachal Pradesh) and extreme N Myanmar.

*P. o. austeni* Hume, 1881 – NE India (Meghalaya E to Nagaland and S to Mizoram), SE Bangladesh and N Myanmar.

*P. o. ochraceiceps* Walden, 1873 – SE Myanmar (including N Tenasserim), NW Thailand, S China (S Yunnan) and N Indochina.

*P. o. alius* Riley, 1940 – N Thailand, S Laos and Vietnam (C & S Annam).



**Descriptive notes.** 22–24 cm; 33–38 g. Distinctive, with long decurved orange bill. Nominative race has crown and upperparts, upperwing and tail rufescent mid-brown; long supercilium white, lores (including nalar feathering) and cheek black, ear-coverts blackish-bronze; chin and submoustachial area to mid-belly white, flanks buffish, becoming greyer lower down and on thighs and vent; iris sandy yellow to dull pinkish-cream; bill orange to orange-red; legs slate-green or yellowish-brown. Distinguished from very similar *P. ferruginosus* by longer, more decurved, and orange bill. Sexes similar. Juvenile has shorter bill than adult. Race *austeni* is

duller than nominate, more olive-tinged above, wings pale brown, tail mid-brown, underparts off-white, flanks to vent tinged greyer. *stenorhynchus* is like nominate, but ear-coverts black, breast and belly warm buff. *alius* is like nominate, but tail darker above. Voice. Highly vocal; groups give a variety of mellow and harsh notes. Song a hurried staccato hollow piping “wu-wu-wu”, “wu-wu-wu”, “wu-wu-whip”, “pu-pu” or “koyou-dip”, and the like, sometimes answered (perhaps by female) with thin nasal downslurred “wyee” or “kveee”; also, very rapid “wi-wuwu” and loud whistled “u-wip”, repeated after pauses. When alarmed, gives short repeated bursts of harsh scratchy guttural rattles, e.g.

“whi-chutututut”, “whi-trrrrrt whi-trrrrrt”, “tchrrrrtutut tchrrrrt...”, variable sounds (often combined) when excited, include rapid purring “wrrrrrr”, clear “wuhu-wuhu”, nasal “woiee-woiee”, weak “whiu-whiu”, high “wheep”, harsh, dry short rising “whéesh!”, high rising “whi”, and steeply descending, buzzy nasal complaining “nyááh”, often interspersed with dry buzzy rising rattles.

**Habitat.** Broadleaf evergreen forest, bamboo clumps, in Laos also *Fokienia*-dominated forest. Found at 300–2400 m in India, usually above 1220 m in China, 230–1800 m in Myanmar, and 600–1600 m in Thailand and Vietnam.

**Food and Feeding.** Invertebrates, including snails, caterpillars and beetles (Coleoptera); also nectar and seeds. Keeps in pairs or parties of up to six or so individuals, often associating with *Gampsorhynchus* babblers and bird waves. Forages in understorey to middle storey; more arboreal than congeners, sometimes up to 12 m above ground. Also forages on ground, and probes into flowers of forest trees for nectar.

**Breeding.** Mar–Jul. Nest an oval ball made of broad grass blades, bamboo leaves and a few other dead leaves, loosely put together, lined with finer materials and rootlets, placed on ground, nearly covered by fallen leaves, or low down in undergrowth or creepers. Clutch 3–5 eggs, white. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon in NE hills in India; fairly common in Namdapha National Park (Arunachal Pradesh). Evidently very localized and rare in Bangladesh. Uncommon in China. Generally uncommon in SE Asian range. Uncommon in Nam Nao National Park, in Thailand. Common in Nam Kading and Dong Hua Sao National Biodiversity Conservation Areas (NBCAs) and in Nakai-Nam Theun NBCA, in Laos. In Vietnam, present in Na Hang Nature Reserve and common in Tam Dao National Park (in N), Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam), and Pu Mat and Vu Quang Nature Reserves in the Annamese Lowlands Endemic Bird Area.

**Bibliography.** Ali & Ripley (1948, 1971), Birand & Pawar (2004), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames (1995), Eames *et al.* (2001), Engelbach (1932), Evans & Timmins (1998), Grimmett *et al.* (1998), Hill (2000), Hume & Davison (1878), Katti *et al.* (1992), Lê Manh Hùng *et al.* (2002), Lekagul & Round (1991), Mayr (1938), Meyer de Schauensee (1984), Nguyễn Đức Tu *et al.* (2001), Rasmussen & Anderson (2005), Ripley (1952), Robson (2000), Robson, Eames, Nguyễn Cú & Truong Van La (1993b), Robson, Eames, Wolstencroft *et al.* (1989), Round (1999), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounbolin (1998), Smith *et al.* (1943), Smythies (1986), Stanford & Mayr (1941), Stuart Baker (1901), Thewlis *et al.* (1996), Thompson & Johnson (2003), Tizard *et al.* (1997), Tordoff *et al.* (2002).

## 76. Coral-billed Scimitar-babbler

### *Pomatorhinus ferruginosus*

**French:** Pomatorhin à bec corail **German:** Korallen schnabelsäbler **Spanish:** Cimitarra Coralina

**Taxonomy.** *Pomatorhinus* [sic] *ferruginosus* Blyth, 1845, Darjeeling, India.

Nominate race perhaps better considered a separate species from other races on grounds of its different head pattern and crown-feather shape; such treatment possibly supported by vocal characteristics, but more samples needed. Races *stanfordi*, *formosus* and *phayrei* form a group. Proposed race *mariae* (from Toungoo Hills, in Myanmar) synonymized with *albogularis* owing to improbable distribution, but is slightly weaker buff below than latter and worthy of further investigation; *namdapha* (extreme E Arunachal Pradesh, in NE India) treated as synonym of *stanfordi*. Birds in C Laos paler below than *orientalis* and may represent an undescribed race. Seven subspecies currently recognized.

**Subspecies and Distribution.**

*P. f. ferruginosus* Blyth, 1845 – E Nepal E to NE India (C Arunachal Pradesh) and adjacent S China (SE Xizang).

*P. f. stanfordi* Ticehurst, 1935 – E Arunachal Pradesh, N Myanmar and S China (W Yunnan).

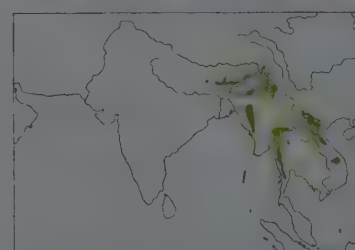
*P. f. formosus* Koelz, 1952 – NE India (Meghalaya E to Nagaland and Manipur).

*P. f. phayrei* Blyth, 1847 – Mizoram (NE India) and SW Myanmar.

*P. f. albogularis* Blyth, 1855 – S & SE Myanmar (including N & C Tenasserim), NW & W Thailand and NW Laos.

*P. f. orientalis* Delacour, 1927 – S China (SE Yunnan), NE Laos and N Vietnam (Tonkin, N Annam).

*P. f. dickinsoni* J. C. Eames, 2002 – S Laos and Vietnam (C Annam).



**Descriptive notes.** 24 cm; 40–48 g. Largish scimitar-babbler with white supercilium, black mask and medium-length red bill, underparts rich rufous in W of range, increasingly pale in E. Nominative race has crown, lores, cheek, ear-coverts and rear neck side black, with spray of pointed buff-based chestnut feathers above lores forming start of long white supercilium; upperparts warm olive-brown, upperwing and tail warm brown; chin, upper throat and submoustachial stripe (extending to lower neck side) white, lower throat, breast and mid-belly rich tawny-rufous, shading on lower underparts to ochrous-brown; iris golden-yellow to cream-

buff; bill deep coral-red or flame-scarlet; legs pale yellowish-brown. Sexes similar. Juvenile is more rufescent above and below than adult. Race *formosus* has crown concolorous with upperparts (except for narrow black upper edge of supercilium), lacks elongate or different-coloured feathers on forehead, underparts paler and buffier; *phayrei* is like previous, but slightly more olive above, paler below. *stanfordi* is like last, but browner above, paler (creamy buff) below, with bolder black lateral crownstreaks meeting on forehead; *albogularis* resembles previous but richer, more rufescent-brown, above, slightly warmer buff below; *orientalis* is like previous, but richest brown above of all races; *dickinsoni* is slightly more olive above than last, and almost entirely white below, with flanks vaguely buff or olive-brown. Voice. Apparent song of nominate a loud, piercing, rich, slightly burry, slurred “fiéwufiéw”, reminiscent of that of Large Hawk-cuckoo (*Cuculus sparverioides*) but more deliberate, with different rhythm; varied by slightly raspier, slower “fu-fiéwufiéw”, “fi-fiéwufiéw”, and sweet slurred whistles of 1–3 notes suggesting an oriole (*Oriolus*), e.g. “wheeeer” or “twheeeer”. In SE Asia several birds may unite to produce wide variety of sounds, including soft, questioning “whu”, “whiu” and “whoiee”, meowing “whheeeer”, shrill yelping “yep-yep-yep...” and short squeaky notes, along with more typical hawk scolding “whit-whit-tehrrrrt”, “tehrrrt-tehrrrrt” and “whitchitt”, etc.; also a scratchy “weeitch-oo” and shrill “wheep-wheep”; clear whistled “ch-wooa” also recorded. Calls of nominate include subdued murmuring descending laughing, and explosive whinash with much softer, hissing rattle, “weesh-sh-sh”.

sh'sh'sh'sh"; in SE Asia, when alarmed, gives harsh dry "krrrrt", "krururutt" or "krrrrrrurur", less scratchy and piercing than equivalent call of *P. ochraceiceps*.

**Habitat.** Broadleaf evergreen forest, bamboo, secondary growth, wild banana groves in gulleys, but in Bhutan associated with areas of continuous forest and absent from more fragmented forests (yet still seems to select denser patches of vegetation with much bamboo where landslides have broken up continuous canopy). In Nam Theun watershed, in Laos, common in dry evergreen forest at 1000–1400 m but commoner in *Fokienia*-dominated forest at 1400–1800 m. Found at 400–2400 m in Indian Subcontinent; 1000–2000 m in Bhutan, 800–2285 m in SE Asia and China.

**Food and Feeding.** Insects and larvae; observed also to peel off and swallow thin strips of bamboo. Very elusive, found in pairs or small parties, rummaging on ground among fallen leaves, moving from cover to cover in big hops; reluctant to fly. Sometimes in association with mixed feeding flocks. Ascends to lower storey.

**Breeding.** Apr–Aug. Nest sometimes attended by three birds (Laos). Nest an oval or bulky cone placed on side, made of dry bamboo, rattan or other leaves, grasses, plant fibres and stems, creepers, twigs, fern fronds, and tendrils, lined with fibrous strips of bamboo, rootlets and fine grasses, placed on ground, sometimes on natural mound, or low down among stalks and leaf litter, in bush, sapling, tangled grass or bamboo clump, sometimes as high as 2 m above ground. Clutch 3–5 eggs (usually 3 in Myanmar), white. No other information.

**Movements.** Resident.

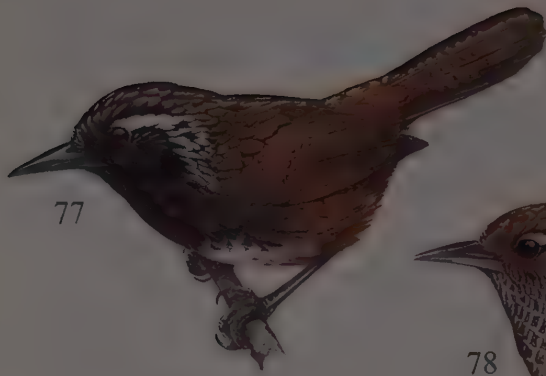
**Status and Conservation.** Not globally threatened. Rare in Nepal: known only from sightings in Arun valley in 1973. Uncommon and local in Bhutan, although possibly overlooked; but more thinly spread than either *P. erythrogeus* or *P. ruficollis*. Rare in W of range in India, but locally frequent in E; present in Buxa Tiger Reserve (West Bengal) and Eaglenest Wildlife Sanctuary and Namdapha National Park (Arunachal Pradesh). Rare in China. Generally uncommon in SE Asian range. Uncommon in Doi Inthanon National Park, in Thailand. In Laos, present on Bolovens Plateau in Dong Hua Sao National Biodiversity Conservation Area (NBCA), and in Phou Dendin NBCA, and common in Naka-Nam Theun NBCA. Present in Pu Mat and Vu Quang Nature Reserves and fairly common in Tam Dao National Park, in Vietnam.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Betts (1956), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2003), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames *et al.* (2001), Evans & Timmins (1998), Godwin-Austen (1870), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), Lekagul & Round (1991), Li Dehao & Wang Zuxiang (1979a), Nguyễn Duc Tu *et al.* (2001), Oates (1883), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robertson (1993), Rohson (2000), Round (1999), Showier, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Singh (1995), Smith *et al.* (1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Ticehurst (1939), Timmins & Wilkinson (1996), Tizard *et al.* (1997), Zheng Zuoxin *et al.* (1983).

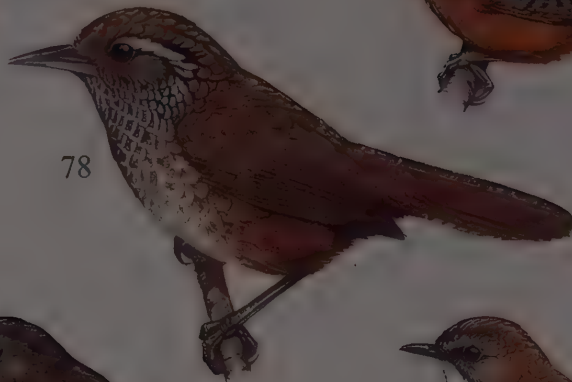


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PLATE 7



77



78

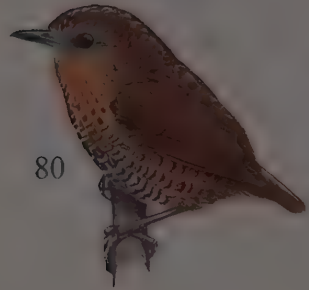


*ssp. troglodytoides*

79



*ssp. sheriffi*



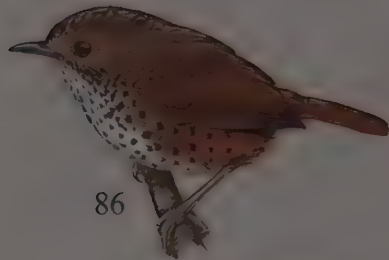
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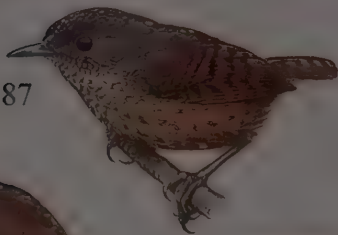
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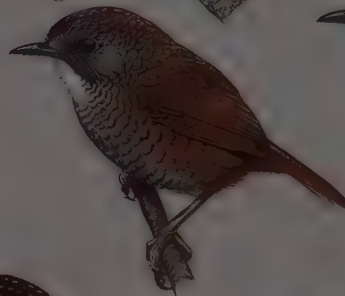
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84



87



85



dark morph



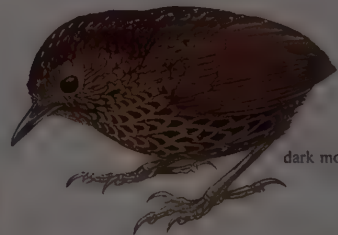
88

pale morph



89

pale morph



dark morph



dark morph



90

pale morph



dark morph



*ssp. pusilla*

pale morph



91

*ssp. timorensis*

## Genus *SPHENOCICHLA*

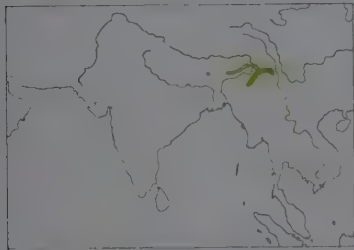
Godwin-Austen & Walden, 1875

### 77. Blackish-breasted Babbler

#### *Sphenocichla humei*

**French:** Timalie à gros bec **Spanish:** Ratina Picocuña Occidental  
**German:** West-Keilschnabeltimalie  
**Other common names:** Western/Sikkim Wedge-billed Babbler; Wedge-billed Babbler/Wren-babbler (when treated as conspecific with *S. roberti*)

**Taxonomy.** *Heterorhynchus Humei* Mandelli, 1873, Sikkim, India. Formerly treated as conspecific with *S. roberti*, but song different. Monotypic.  
**Distribution.** Extreme E Nepal, Sikkim and N West Bengal E to Bhutan and NE India (NE Arunachal Pradesh).



**Descriptive notes.** 18 cm. Blackish babbler with wedge-shaped bill, and subtle plumage pattern of buff streaks above and minute grey scaling below. Entire upperside is blackish-brown, each feather internally buff, those of lores and forehead with whitish shaft streaks, those of mid-crown to mantle with bright buff shaft streaks and well-separated barbs, those of back to uppertail-coverts similar but duller buff-brown and with narrow blackish-brown bars; upperwing and tail shinier blackish-brown with dull brown barring; head side has reduced internal markings on lateral crown (producing effect of vague blackish lateral

crownstripe), whitish postocular supercilium breaking up on neck side into series of whitish streaks; rest of face (ear-coverts, cheek, submoustachial area) and chin blackish-brown with whitish shaft streaks, throat to upper belly similar but streaks greyer and with very narrow pale stone-grey edges (producing barely perceptible scaling), central belly irregularly stone-grey, lower flanks, lower belly, thighs and vent scaled buffy-ochre and blackish-brown; iris colour apparently undescribed (dark brown in photo); bill pale bluish slaty, base darker; legs powerful, dark brown. Sexes similar. Juvenile apparently undescribed. **Voice.** Songs include loud, melodious, piping, slurred whistles, often given in duet; types include short subdued notes followed by quick liquid fluty whistles that are slurred steeply up and down, "twittwittwhitt-fúwééféwéoo", sometimes more hurried and squealed, or may start near top and quickly warble downwards. Calls include strident, peevish, deliberately paced set of whistles, "chyuuw, chéét-chéét, chéét"; alarm a subdued low "hrrrr hrrrr hrrrr hrrrr it hrrrr hrrrr..."

**Habitat.** Floor and understorey of broadleaf evergreen forest, bamboo brakes; in Bhutan prefers tall broadleaf forest with W-facing aspect. At 900–1950 m; in Bhutan, present at 1600 m and 1950 m in breeding season, at 1100 m in winter.

**Food and Feeding.** Few details available. Relatively arboreal at times. Often hunts in quite dense undergrowth near streams. Habits thought to be similar to those of *S. roberti*.

**Breeding.** No information available.

**Movements.** Resident; seasonal elevational movement inferred in Bhutan requires substantiation.  
**Status and Conservation.** Not assessed. When lumped with *S. roberti*, considered Near-threatened. Restricted-range species: present in Eastern Himalayas EBA. In Nepal, so far only recorded from Dharan district. Rare in Bhutan, but discovered there as recently as 2000, and one site (Kuri Chhu valley, inside Thrumshingla National Park) may harbour significant population; most of probable range, however, lies outside protected areas and this species' future in the country will depend on forest management practices. Status in India uncertain, but recorded in Namdapha National Park and Mehao Wildlife Sanctuary, in Arunachal Pradesh. Although forest within its elevational range is relatively secure, shifting cultivation and logging are reducing forest cover at lower levels.

**Bibliography.** Ali & Ripley (1971), Anon. (2006d), Boetticher (1930), Butchart & Stattersfield (2004), Choudhury (2000), Collar (2006), Collar *et al.* (2001), Grimmett *et al.* (1998), Inskipp *et al.* (2000), Karki & Choudhury (1997), Katti *et al.* (1992), Lightfoot (1939), Mandelli (1873), Rasmussen & Anderton (2005), Singh (1995), Spienberg (2005), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevens (1924).

### 78. Chevron-breasted Babbler

#### *Sphenocichla roberti*

**French:** Timalie de Robert **Spanish:** Ratina Picocuña Oriental  
**German:** Ost-Keilschnabeltimalie  
**Other common names:** Cachar/Eastern Wedge-billed Babbler; Wedge-billed Babbler/Wren-babbler (when treated as conspecific with *S. humei*)

**Taxonomy.** *Sphenocichla roberti* Godwin-Austen and Walden, 1875, North Cachar and Manipur Hills, India.

Formerly treated as conspecific with *S. humei*, but song different. Monotypic.  
**Distribution.** NE India from E Arunachal Pradesh (Mishmi Hills) S to Assam (N Cachar, Margherita), Nagaland and N Manipur; N Myanmar and adjacent S China (NW Yunnan).

**Descriptive notes.** 18 cm: 29–43 g. Similar in size to *S. humei*, and with same pointed and conical bill, but paler owing to very different, though equally subtle, plumage pattern; bill slightly larger and tail shorter. Lores to mid-crown are rusty brown with darker edging, shading on hindcrown to uppertail-coverts to warm buff-brown with blackish-brown fringes, most with whitish inner fringes (making for slightly chevron-shaped scaled effect); weaker and rustier on rear upperparts, upperwing and tail barred blackish-brown and dull brown (appearing paler than *S. humei*, because dark bars



narrower); head side mainly whitish-grey with dark brown scaling, partial whitish ceyring strongest above eye, where extends back as whitish postocular supercilium, ear-coverts plain brown with pale shaft streaks; elaborate pattern from chin to breast and flank sides of triangular (chevron-shaped) scales involving broad buffy-brown feather centres, stony-white inner fringes in pointed "V", and dark outer fringes (barb extensions), lower underparts losing pattern as buffy brown predominates; iris rich brown to dark crimson; bill blackish-brown with horn-grey tip, lower mandible bluish basally; legs powerful, dark brown. Sexes

similar. Juvenile apparently undescribed; museum specimen with rustier forehead, little or no barring on wings and rustier posterior upperparts and underparts may be immature. **Voice.** Song a clear, loud, fluty, melodious "uu-wii-wu-yu" ("wii" highest, "yu" lowest), lasting 1.1–1.2 seconds and repeated every 6–17 seconds; very different from that of *S. humei*. Calls apparently similar to those of latter.

**Habitat.** Evergreen forest with large trees and bamboo on edge of dense jungle, at 300–2010 m.

**Food and Feeding.** Woodlice (Isopoda), small boring beetles (Coleoptera) and other insects. Found in parties of 10–15 individuals. Relatively arboreal at times; active climber about rough bark of bigger trees, though not higher branches. Often hunts in quite dense undergrowth near streams.

**Breeding.** May–Jun. Nest reportedly a pad of moss on top of mass of fine grasses and a few tendrils and bents, no lining other than soft moss, wedged behind long hanging slip of bark (built at bottom of long crevice) 6.5 m above ground on oak tree. Clutch 4 eggs, white. No other information.

**Movements.** Resident; report of seasonal elevational movements in Assam requires substantiation.

**Status and Conservation.** Not assessed. When lumped with *S. humei*, considered Near-threatened. Generally scarce. Scarce in Namdapha National Park (Arunachal Pradesh), in India. Judged very rare in China. Although forest within its elevational range is relatively secure, shifting cultivation and logging are reducing forest cover at lower levels. In India, seen to be traded as food (dead bird) in Kohima (Nagaland) in 1997.

**Bibliography.** Ali & Ripley (1971), Choudhury (2000, 2001), Collar (2006), Godwin-Austen & Walden (1875), Grimmett *et al.* (1998), Han Lianshan (1992), King *et al.* (2001), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robson (2000), Smythies (1949, 1986), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart Baker (1894), Ticehurst (1939).

## Genus *SPELAEORNIS* David & Oustalet, 1877

### 79. Bar-winged Wren-babbler

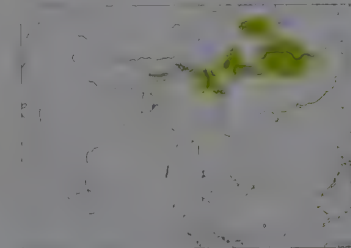
#### *Spelaeornis troglodytoides*

**French:** Timalie troglodyte **German:** Binden-Zaunkönigstimalie **Spanish:** Ratina Aliharrada  
**Other common names:** Long-tailed Spotted Wren-babbler

**Taxonomy.** *Phoeopyga troglodytoides* J. Verreaux, 1870, "les montagnes du Thibet chinois" = Muping [Paohing], south-east Xizang, China. Seven subspecies recognized.

**Subspecies and Distribution.**

- S. t. sherriffi* Kinnear, 1934 – E Bhutan and adjacent NE India (W Arunachal Pradesh).
- S. t. indiraji* Ripley *et al.*, 1991 – SE Arunachal Pradesh (Namdapha National Park), in NE India.
- S. t. souliei* Oustalet, 1898 – NC Arunachal Pradesh (NE India) E to N Myanmar and S China (NW Yunnan W of R Salween).
- S. t. rocki* Riley, 1929 – NW Yunnan (E of R Salween).
- S. t. halsueti* (David, 1875) – C China (S Gansu, S Shaanxi, N & NE Sichuan).
- S. t. nanchuanensis* Li Guiyuan *et al.*, 1992 – SC China (C Sichuan, Hubei, Hunan).
- S. t. troglodytoides* (J. Verreaux, 1870) – S China (SW & WC Sichuan S to extreme NE Yunnan and N Guizhou).



**Descriptive notes.** 10 cm. Long-tailed, rufous-brown wren-babbler with white-spotted blackish head, white breast, barred wings and tail. Male nominate race has crown and nape blackish, tinged rufous and heavily spotted white, lores, cheek and ear-coverts deep orange-buff; upperparts umber-brown, each feather with white subterminal bar and black tip (creating heavy spotting effect), upperwing and tail narrowly barred whitish and black; throat white, underparts dull rufous, white streaks extending from throat to breast; iris red-ochre to brown; bill brown or blackish-horn, paler lower mandible; legs horn-brown or olive. Female

has more rufous-streaked throat, more extensive and brighter rufous below. Juvenile is much darker than adult, blackish-brown above, with reddish-buff streaks on crown and bars on back, barring on wings and tail less coherent, more vermiculate. Races differ mainly in pattern and tone of plumage: *nanchuanensis* is less strongly spotted above than nominate, with no white throat; *halsueti* has upperparts greyish-brown, cheek and ear-coverts pale orange-buff; *sherriffi* has white of breast extending brokenly onto belly and there tipped dark; neck side and flanks browner, whiter markings on neck side, juvenile with throat and belly whitish; *indiraji* has crown and nape blackish with mix of pale spotting and fine barring of grey-brown (forming distinct cap), uppertail and wings washed dull brownish-grey, tail barred grey and black, flanks deep rufous; *canis* has cheek and

On following pages: 80. Rufous-throated Wren-babbler (*Spelaeornis caudatus*); 81. Rusty-throated Wren-babbler (*Spelaeornis hadaogularis*); 82. Naga wren-babbler (*Spelaeornis phoeniceus*); 83. Grey-bellied Wren-babbler (*Spelaeornis reptans*); 84. Pale-throated Wren-babbler (*Spelaeornis kincairdi*); 85. Tawny-breasted Wren-babbler (*Spelaeornis longicaudatus*); 86. Chin Hills Wren-babbler (*Spelaeornis ostesi*); 87. Spotted Wren-babbler (*Elachura formosa*); 88. Scaly-breasted Wren-babbler (*Phoeopyga albiventer*); 89. Taiwan Wren-babbler (*Phoeopyga formosana*); 90. Nepal Wren-babbler (*Phoeopyga immaculata*); 91. Pygmy Wren-babbler (*Phoeopyga pusilla*).



ear-coverts brown with buff shaft streaks, greyish-brown upperparts, white of throat heavily obscured with brown and rufous, juvenile underparts dull rufous; *rocki* has cheek and ear-coverts brown with buff shaft streaks, paler neck side and underparts. Voice. Song a repeated husky rapid rolling warble of 5–8 notes, "ch'whi-whi-whi-whi-whi-whi-whi" or "ch'whi-whi-whi-whi"; series also reported as starting with longer, strongly upslurred note and ending with shorter, lower and quieter note than first, regularly repeated at intervals of 2–3 seconds.

**Habitat.** Dense undergrowth and bamboo thickets in moist cool temperate forest, including deciduous, rhododendron, oak, mixed hemlock-broadleaf and fir forest. Found at 2300–3500 m in Indian Subcontinent, 2440–2895 m in Myanmar, and 1600–2440 m in China.

**Food and Feeding.** Insects, including beetles (Coleoptera). Sometimes in small groups up to six individuals, even in late Apr (breeding period). More arboreal than most wren-babblers, clambering about on bamboo stems and mossy tree trunks, up to 1.5 m above ground.

**Breeding.** Season Mar–Jun. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally rare over most of range. Uncommon in Bhutan, where known mainly from forest between Sengor and Namling (Mongar district), with occurrence in other areas rather unpredictable; most records are from within protected areas, including Thrumshingla National Park. Rare in India, where present in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Scarce in Myanmar. Rare and local in China; scarce at Emei Shan Protected Scenic Area, in Sichuan.

**Bibliography.** Ali & Ripley (1971), Cheng Tsohsin (1987), Choudhury (2003), Deditius (1897), Dowell *et al.* (1997), Greenway (1933), Grimmer *et al.* (1998), Inskipp *et al.* (2000), Li Guiyuan *et al.* (1992), Ludlow & Kinnear (1937, 1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Riley (1926), Ripley *et al.* (1991), Robson (2000), Rothschild (1926), Singh (1995), Smythies (1949), Spienberg (2005), Stanford (1941), Stanford & Mayr (1941), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Zheng Zuoxin & Qian Yanwen (1973).

## 80. Rufous-throated Wren-babbler

### *Spelaeornis caudatus*

**French:** Timalie à gorge rousse **German:** Rotkehl-Zaunkönigstimalie **Spanish:** Ratina Golirrufa  
**Other common names:** Tailed/Short-tailed Wren-babbler

**Taxonomy.** *Tesia*, *caudata* Blyth, 1845, Darjeeling, India.

May form a superspecies with *S. badeigularis*; often treated as conspecific, but recent museum and field studies support treatment as separate species. Monotypic.

**Distribution.** E Nepal E to NE India (W Arunachal Pradesh).



**Descriptive notes.** 9 cm; 10–12 g. Small brown wren-babbler with rusty throat and breast and dark, white-spotted belly. Crown to lower back are darkish brown with indistinct darker brown scaling, fluffy feathers of rump plainer dark brown, upperwing and tail plain dark brown, former with slight rusty fringes; face (forehead, lores, ear-coverts and submoustachial area) plain brownish-tinged grey, chin to breast and flanks plain rusty rufous, becoming increasingly spotted with black on breast and flanks such that lower underparts become slaty while rufous becomes spotted and shades to whitish on mid-belly to vent; iris brown; bill blackish;

legs brown. Sexes similar. Juvenile is plainer than adult, more reddish above without scalloping, rusty colour of throat paler and barring indistinct. Voice. Song a powerful, jangling short outburst, "witchu-witchu-witchu-witchu", first note slightly higher; also a slightly more trisyllabic "whitchu-..." or with first note slightly drawn out. Alarm a low "birrh birrh birrh", uttered for rather lengthy periods when disturbed; calls a soft "churrp", "chip" or "chitturp", much softer than typical call of *Pnoepyga*, sometimes in series as soft, liquid churring rattle; while foraging, may continually give these calls as subdued muttering.

**Habitat.** Dense thickets and undergrowth in moist broadleaf evergreen forest, in secluded valleys and steep narrow gulleys, especially where ferns, mossy rocks and fallen trees abound, and commonly with a W or N aspect. Elevational range in Bhutan 1400–2400 m, suggesting close link with ecotone between warm and cool broadleaf-forest zones; 1800–2400 m in India, 2135–2440 m in Nepal.

**Food and Feeding.** Insects. No other information.

**Breeding.** Little known, and published records not entirely reliable. Song period in Bhutan mid-Mar to mid-May, with second period in early Aug. Nest described as made of leaves, fine twigs, bracken and grass, lined with vegetable down or other matter, resembling earth-brown papier-mâché, or as dense mass of moss, cup-shaped and placed about roots of tree or in hole in fallen log. Clutch said to be of 3–4 eggs, white with reddish spots (as those of *S. longicaudatus*).

**Movements.** Resident, with minor altitudinal movements.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Eastern Himalayas EBA. Very rare in Nepal, with no known records since 1993. In Bhutan, probably the key country for the species (given its small range and habitat needs), frequently recorded, mainly through song; present in Thrumshingla National Park, where stronghold in forests between Namling and Yonkhola, with 4–8 territories along 24 km of road at suitable elevations, and at one site in Jigme Singye Wangchuck National Park. Locally common in India, where present in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). At risk from destruction and fragmentation of forest within its small range, chiefly through logging and shifting cultivation, but probably more widespread and abundant than current records imply.

**Bibliography.** Ali & Ripley (1971), Anon. (2006d), Bishop (1999), Butchart & Stattersfield (2004), Choudhury (2003), Collar (2006), Collar *et al.* (2001), Grimmer *et al.* (1998), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Ludlow & Kinnear (1937, 1944), Mariens & Eick (1995), Rasmussen & Anderton (2005), Singh (1995), Spienberg (2005), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevens (1924).

## 81. Rusty-throated Wren-babbler

### *Spelaeornis badeigularis*

**French:** Timalie des Mishmi **German:** Mishmi-Zaunkönigstimalie **Spanish:** Ratina Mishmi  
**Other common names:** Mishmi Wren-babbler

**Taxonomy.** *Spelaeornis badeigularis* Ripley, 1948, Dreyi, Mishmi Hills, north-eastern Assam, India.

May form a superspecies with *S. caudatus*; often treated as conspecific, but recent museum and field studies support treatment as separate species. Monotypic.

**Distribution.** E Arunachal Pradesh (Mishmi Hills), in NE India.



**Descriptive notes.** 9 cm. Very similar to *S. caudatus*, but has darker upperparts, darker grey ear-coverts, white chin and upper throat, chestnut lower throat and breast with dark-streaked feather centres (chestnut not running to flanks), dark brown flanks and vent, more barring on underparts, and longer, stouter tarsus; when singing, exhibits distinct whitish crescent on lower edge of chestnut breast; iris brown; bill black; legs brown. Sexes similar. Juvenile apparently undescribed. Voice. Song highly variable, ranging from simple 3-note or 4-note whistle or short complex warble to combination of short warble and short trill, all

involving short staccato musical whistles, and generally much less structured than that of *S. caudatus*: sudden, rapid, explosive "chipichiwichichit" or "chipihuwichichit" repeated after intervals of 5–22 seconds, also shorter outbursts of "whi'chitu" or "whi'pichu" and "chu'wit-w'ch'ch'ch'ch" (quick introduction followed by trill). Each individual appears to have repertoire of at least three songs.

**Habitat.** Only specimen was in subtropical wet forest in winter at 1600 m. Recently relocated in mostly secondary broadleaf evergreen forest at 1700–2400 m, when present in dense low undergrowth 1–3 m tall with usually broken canopy of trees.

**Food and Feeding.** Insects. Recently observed individuals kept mostly within 1 m of ground.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species; present in Eastern Himalayas EBA. Since its initial discovery, in late 1940s, was not seen again in 20th century, doubtless because of problems over access to its only known site of occurrence. Subsequently, observations in 2004 in Mishmi Hills (specifically on Roing–Hunli road, on both N & S sides of Mayodia Pass) revealed that, with tape playback, as many as eight different individuals could be triggered into singing along 3 km of road, indicating substantial abundance within highly limited known range. Subtropical forest in Dibang and Lohit districts in S Mishmi Hills is disappearing owing to timber extraction. Species possibly occurs in Mehao Wildlife Sanctuary, in Mishmi Hills, and possibly nearby at site such as Mouling National Park.

**Bibliography.** Ali & Ripley (1948, 1971), Anon. (2006d), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Grimmer *et al.* (1998), King & Donahue (2006), Rasmussen & Anderton (2005), Ripley (1948, 1950a), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 82. Naga Wren-babbler

### *Spelaeornis chocolatinus*

**French:** Timalie chocolat **German:** Langschwanz-Zaunkönigstimalie **Spanish:** Ratina Chocolate  
**Other common names:** Austen's/Streaked/Long-tailed Wren-babbler, Streaked Long-tailed Wren-babbler

**Taxonomy.** *Pnoepyga chocolatina* Godwin-Austen and Walden, 1875, Kedimai, Manipur, India. Formerly treated as conspecific with *S. reptatus*, *S. kinneari* and *S. oatesi*. Monotypic.

**Distribution.** Nagaland and N Manipur, in NE India.



**Descriptive notes.** 10 cm; 11–15 g. Small dark wren-babbler with strong buffy streaks on brownish flanks. Male has crown to rump slightly warm olive-brown with darker fringes (vague scaly effect), plain upperwing and medium-length tail slightly more rufescent; lores and ear-coverts olive-tinged buffish-grey, chin pale buffy, shading to rich ochrous-brown on breast, flanks and belly with small buffy dots and dark marks and, on flanks, broad-ended buffy shaft streaks, mid-belly flecked with white; iris reddish-brown; bill dark brown, paler tip; legs fleshy-brown to light brown. Female is more rufescent above and below.

Juvenile apparently undescribed. Voice. Undescribed.

**Habitat.** Inhabits montane broadleaf evergreen forest with undergrowth of bracken, ferns or *Strobilanthes*, on steep hillsides broken with rocks and large boulders covered with rich vegetation and green moss, and thick low (often thorny) bushes, briars and dwarf bamboo, especially at edge of evergreen forest and in clearings; often in dense undergrowth near water. Found at elevations of 1200–3100 m.

**Food and Feeding.** Diet includes ants (Formicidae), small beetles (Coleoptera) and other insects. Very active; often found up to 0.6 m above ground, and not so exclusively ground-dwelling as *Pnoepyga*.

**Breeding.** One reported nest, in May, a deep cup with long back wall (though not enough to form roof), made of leaf skeletons bound together with dark, coarse fern roots, grass bents, and fine elastic twigs, lined with leaf skeletons, placed on pile of dead leaves, twigs and branches under fallen log. Clutch 3 eggs, white with very pale reddish marks, especially near broad end. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Conservation status warrants review following recent taxonomic split, as species is scarce and highly restricted in range.

**Bibliography.** Ali & Ripley (1971), Collar (2006), Godwin-Austen & Walden (1875), Grimmer *et al.* (1998), Rasmussen & Anderton (2005), Ripley (1952), Stuart Baker (1922).

## 83. Grey-bellied Wren-babbler

### *Spelaeornis reptatus*


**French:** Timalie de Bingham **German:** Graubauch-Zaunkönigstimalie **Spanish:** Ratina Ventrigris



**Distribution.** Extreme NE India (E Arunachal Pradesh), N & E Myanmar, S China (NW & W Yunnan) and W Thailand.

**Bibliography.** Bingham (1903), Cheng Tsohsin (1987), Collar (2006), Harington (1909, 1914a), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robson (2000), Round & Pattanavibool (2003), Smythies (1940, 1986), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938).

**French:** Timalie de Kinnear **German:** Blasskehl-Zaunkönigstimalie **Spanish:** Ratina Gorjipálida



**Status and Conservation.** Not assessed. Locally common within small range, although judged rare in China. Present in Fan Si Pan National Park, in Vietnam. In China, first recorded in NW Guangxi in May 2002, when four wren-babblers observed in Cenwanglaoshan Nature Reserve believed to belong to this species.

ar (2006), Harington (1909, 1914a), Meyer de Schauensee (1935), Robson (2000), Round & Pattanavibool (2003), Smythies (1935, 1938).

**Descriptive notes.** 11–12 cm. Small dark wren-babbler with pale throat. Male is dark bronzy brown with black scaling above, becoming plainer and more deep ochrous-brown on fluffy rump feathers; upwearing and tail dark brown with slight rufous tinge; head side dark brownish-grey with vague blackish-brown preocular patch and submoustachial area; chin and throat dirty white with some vague mid-brown mottling, this becoming stronger on upper breast and changing rapidly to deep bronzy-grey underparts with blackish scaling and a few white tips (most grey down centre of underparts, most bronzy brown on

very common within small range, although judged rare, in Vietnam. In China, first recorded in NW Yunnan, it has been observed in Cenwangaoshan Nature Reserve

below. Male has crown, submoustachial area and malar area connecting to neck side and upperparts olive-brown with darker fringes (creating rather dense but vague scaly effect), plain upperwing and tail slightly more rufescent; lores and ear-coverts olive-buff; chin to lower belly white with dark brown spots. Flanks olive-brown with buff and dark spots, thighs and vent plain olive-brown; iris brown; bill blackish; legs brown. Female is very like male, but slightly duller white below. Juvenile

**Food and Feeding.** Food presumably small invertebrates. Usually seen foraging within 0.5 m of ground.



Bibliography: Collar (2006), Grinnett *et al.* (1998), Rasmussen & Anderton (2005), Robson (2000), Smythies (1940, 1986), Siresmann & Heinrich (1940a), Thei Zaw Naing (2003).

Genus *ELACHURA* Oates, 1889

### 87. Spotted Wren-babbler

*Elachura formosa*

**French:** Timalie tachetée **German:** Fleckenbrust-Zaunkönigstimalie **Spanish:** Ratina Moteada  
**Other common names:** Spotted Short-tailed Wren-babbler, Spotted Wren

**Distribution.** E Nepal E to NE Indian hill states, NE Bangladesh, N & W Myanmar, SE China (W, C & SE, Yunnan E to Hunan, NW Fujian and N Guangdong), N & C Laos and N Vietnam (W Tonkin, N Annam).

**Bibliography.** Ali & Ripley (1971), Birand & Pawar (2004), Bishop (1999), Cheng Tsohsin (1987), Choudhury (2000), Davidson (1998), Dymond (2002), Farnes *et al.* (2001), Evans & Timmins (1998), Grimmer *et al.* (1998), Inskip & Inskip (1991), Inskip *et al.* (2000), King *et al.* (2001), La Touche (1899), Lewthwaite (1996), Ludlow & Kinnear (1937), Meyer & Schauenstein (1984), Rasmussen & Anderson (2005), Robson (2000), Robson *et al.* (1998), Singh (1995), Smythies (1986), Spierenburg (2005), Stresmann & Heinrich (1940a), Thewlis *et al.* (1998).

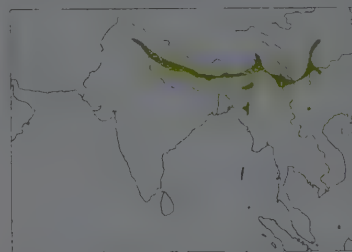
Genus *PNOEPYGA* Hodgson, 1844

## 88. Scaly-breasted Wren-babbler

*Pnoepyga albiventer*

**Taxonomy.** [*Tesia*] *Albiventer* Hodgson, 1837, Ilam District, eastern Nepal. Formerly treated as conspecific with *P. formosana*. Two subspecies recognized.

*P. a. albiventer* (Hodgson, 1837) – EC Nepal E to Bhutan and NE Indian hill states (except Meghalaya), S & SC China (S & SE Xizang, N & C Sichuan S to NW Yunnan), N & W Myanmar and N Vietnam (W Tonkin).



**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Birand & Pavar (2004), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Choudhury (2003), Collar (1996), Dowell *et al.* (1997), Gaston *et al.* (1994), Godwin-Austen (1870), Grimm *et al.* (1998), Huang Qiang *et al.* (1993), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), King (1989b), Koezl (1954), Li Guiyuan *et al.* (1976), Ludlow (1951), Ludlow & Kinner (1937, 1944), Martens & Eek (1991, 1995), Meyer de Schauensee (1964), Mohan (1997), Pandey *et al.* (1994), Rasmussen & Anderson (2005), Ripley (1952), Robson (1986, 2000), Singh, A.P. (2000), Singh, P. (1995), Smythies (1940, 1949), Spicrenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stevens (1924), Stresemann & Heinrich (1940a), Stuart Baker (1894), Tynstra (1993), Zheng Xuoxin *et al.* (1983).

## 89. Taiwan Wren-babbler

*Pnoepyga formosana*

**Habitat.** Dense tangled undergrowth and bamboo in montane broadleaf evergreen and mixed broadleaf-coniferous forest, at 1200–2700 m; elevational limits in N Taiwan 1475–2780 m.



**Descriptive notes.** 7.5–8 cm; 11–15 g. Tiny, almost tailless olive-backed babobird with pale scaling below; in two morphs. Nominative race pale morph ("white-scaled") is greyish olive-brown from crown to rump with slight dark scaling, upperwing brownier, small buffy subterminal spots on scapulars, wing-coverts and tertials; head side greyish olive-brown, ear-coverts with indistinct pale shaft streaks, chin and throat off-white with narrow grey-brown scaling, breast and belly off-

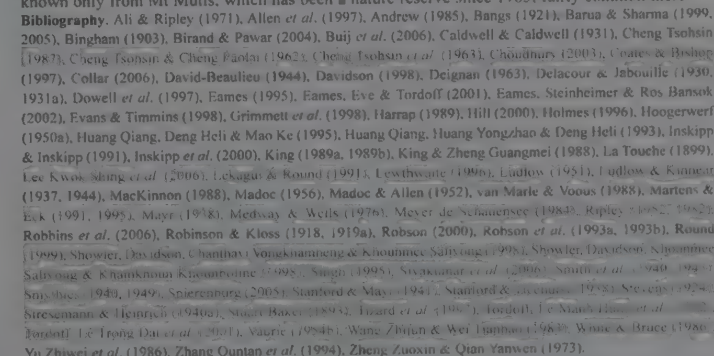






PLATE 8

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# Genus *STACHYRIDOPSIS* Oates, 1883

## 92. Golden Babbler

### *Stachyridopsis chrysaea*

**French:** Timalie dorée **German:** Goldkopftimalie **Spanish:** Timalí Dorado  
**Other common names:** Golden-headed Babbler

**Taxonomy.** *St[achyris]. chrysaea* Blyth, 1844, Nepal. Genus formerly merged with *Stachyris*. Geographical variation poorly defined, and characters separating most of the races very weak; revision probably needed. Populations in N Thailand, S Laos and C Vietnam (C Annam) not yet assigned to race. Six subspecies tentatively recognized.

#### Subspecies and Distribution.

- S. c. chrysaea* (Blyth, 1844) – C Nepal E to Bhutan, NE Indian hill states (except E Mizoram), N & NE Myanmar and adjacent S China (SE Xizang, NW & W Yunnan).
- S. c. binghami* (Rippon, 1904) – E Mizoram (NE India) & W Myanmar.
- S. c. aurata* (Meyer de Schauensee, 1938) – extreme E Myanmar, NW Thailand (S to Chiang Dao), N & C Laos, N Vietnam (Tonkin, N Annam) and S China (S Yunnan E to SW Guangxi).
- S. c. assimilis* (Walden, 1875) – SE Myanmar (including Tenasserim) and NW & W Thailand.
- S. c. chrysops* (Richmond, 1902) – S Thailand and Peninsular Malaysia.
- S. c. frigida* (Hartlaub, 1865) – Sumatra.



**Descriptive notes.** 10–12 cm; 6–10 g. Distinctive small babbler with narrowly striped crown, black half-mask and yellow underparts. Nominate race has crown and nape golden-yellow, narrowly and evenly streaked with black, with strong yellow preocular lateral crownstripe bordering black on lores and short black supercilium; upperparts yellowish-olive, upperwing and tail brownish-grey, flight-feathers with narrow yellow-buff fringes; short black submoustachial stripe from lores, plain yellowish-olive ear-coverts; chin to mid-belly bright yellow, shading on sides and below to olive-yellow; iris red or red-brown to brown or

brown-grey; bill blackish, paler below, often with pinkish-red or pinkish-flesh base of lower mandible; legs pale yellowish-brown to light brown. Sexes similar. Juvenile is duller and browner above than adult, whiter below, with browner flanks. Race *binghami* is more greyish-olive above than nominate, weaker yellow below, ear-coverts dark grey; *aurata* is smaller, with yellowish ear-coverts, less distinct head pattern, paler below; *assimilis* is very like previous, but ear-coverts more greyish-olive, underparts slightly brighter; *frigida* differs from last in greener upperparts, much less deeply yellow crown, pale yellow underparts, dusky olive-green sides of body; *chrysops* is intermediate between preceding two, but more like first of them (*assimilis*). Voice. Song a rapid “tu-tu-tu-tu-tu-tu” or slower “ti-tu-tu-tu-tu”, or “chink-chink-chink-chink-chink”, usually with 5–10 notes and lasting 1–1.25 seconds; like that of *S. rufifrons* but notes tend to be clearer, often sounding more spaced, and usually with more obvious pause (occasionally no pause) after first note. Introductory notes sometimes given singly. When alarmed, utters scolding “chrrrrr-rrr”, “chirrrrr” or “chrrrrr”.

**Habitat.** Broadleaf evergreen forest, bamboo stands, also dense bushes, *Rubus* thickets, deserted cultivation and clearings; also secondary forest, pine forest and upper montane primary vegetation in Sumatra. Found at 300–2600 m in Indian Subcontinent, 450–2600 m in SE Asia (but above 1065 m in Peninsular Malaysia) and China; 680–3000 m in Sumatra (“to highest peaks”). Habitat and altitudinal range very like those preferred by *S. ruficeps*.

**Food and Feeding.** Insects, including ants (Formicidae), caterpillars; occasionally berries. Forages in lower to middle storeys. Outside breeding season (from Aug) found in mixed flocks with Old World warblers (Sylviidae) and other species of babbler, often *Stachyris nigriceps*, or in family groups; sometimes in monospecific flocks.

**Breeding.** Jan–Jul. In Bhutan song heard as early as mid-Feb but mostly late Mar–Jul, with peak territorial activity later, in May–Jun. Nest a dome or ball with entrance near top, made of dry bamboo or other leaves and pine needles, lined with rootlets (or unlined), placed on ground among dead leaves, on bank, in bamboo clump or bush or suspended from pine branch in foliage, up to 0.6 m above ground. Clutch 3–4 eggs, white (may appear pink-tinged when fresh), rarely with faint reddish-brown spots. No other information.

**Movements.** Resident, apparently with some seasonal wandering; in NE India described as occasional migrant in Kaziranga National Park (Assam), although could be low-density resident in area. **Status and Conservation.** Not globally threatened. Rare and local in Nepal. In Bhutan fairly common; near Zhemgang recorded density of 3.4 territories/km of road at 1600–1900 m, making it one of the commonest birds in warm broadleaf forest in country; present in Thrumshingla National Park. Locally fairly common in NE India, where present in e.g. Buxa Tiger Reserve (West Bengal), Nameri National Park (Assam), and Namdapha National Park, Eaglenest Wildlife Sanctuary and Mouling National Park (all Arunachal Pradesh). Status in Bangladesh uncertain, but possibly rare or even extinct. Uncommon in Natumataung National Park, in Myanmar. Common in China, where recently found in Nonggang National Nature Reserve and Chunxiu Nature Reserve, in Guangxi. Generally common in SE Asian range. Common in Doi Inthanon National Park, in Thailand. Common in Dong Hua Sao National Biodiversity Conservation Area (NBCA), locally frequent in Nam Kading NBCA, and common in parts of Nakai-Nam Theun NBCA, in Laos. In Vietnam, present in Ba Be National Park and Na Hang Nature Reserve and common in Tam Dao National Park (all in N), and in six protected areas in the Annamese Lowlands Endemic Bird Area. Present in Gunung Leuser National Park, in Sumatra.

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1992), Banua & Sharma (1999), Betts (1956), Bingham (1903), Birand & Pawar (2004), Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Cheng Tsosin (1987), Cheng Tsosin & Cheng Pao-tai (1969), Choudhury (2003), Davies-Beaman (1944), Davidson (1998), Deignan (1963), Delacour (1929), Delacour & Jansoulle (1931a), James *et al.* (2001), Engelbach (1932), Evans & Timmins (1998),

Grimmett *et al.* (1998), Hill (2000), Holmes (1996), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Katti *et al.* (1992), Kinnear (1929), Koelz (1954), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Ludlow & Kinnear (1937), Madoc (1956), Madoc & Allen (1952), van Marle & Voous (1988), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Oates (1883), Rasmussen & Anderton (2005), Ripley (1952), Robinson (1928), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Singh (1995), Smith *et al.* (1940, 1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1907), Thei Zaw Naing (2003), Thewlis *et al.* (1996), Tizard *et al.* (1997), Tordoff *et al.* (2002), Zheng Zuoxin *et al.* (1983).

## 93. Black-chinned Babbler

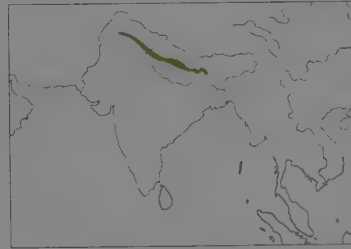
### *Stachyridopsis pyrrhops*

**French:** Timalie à bec rouge **German:** Schwarzkinntimalie **Spanish:** Timalí Barbinegro  
**Other common names:** Red-billed Babbler

**Taxonomy.** *St[achyris]. pyrrhops* Blyth, 1844, Nepal.

Genus formerly merged with *Stachyris*. Monotypic.

**Distribution.** NE Pakistan (Murree Hills) E to E Nepal.



**Descriptive notes.** 10 cm; 8–12 g. Dull biscuit-coloured babbler with red eye and blackish half-mask and chin. Crown is buffy grey (looking creamy from front) with thin brown lines, shading on nape, upperparts, upperwing and tail to plain pale buff-grey; lores to bill base and chin black, supercilium, ear-coverts, submoustachial area, throat and underparts buffy ochre, slightly duller on flanks; iris red; upper mandible dark brown, lower mandible flesh-coloured; legs pale brownish-flesh. Sexes similar. Juvenile is slightly less richly coloured than adult, black areas greyer. Voice. Song a fast series of very short loud whistles, extremely like songs of *S. ruficeps* and *S. rufifrons* but faster and slightly higher, with shorter, less slurred or level notes, and seems to lack offset introductory note; also gives slower version. Calls include soft “chir”, harsh scolding “chirrrrrr” and “irr-wir-wee” or “irr-wir-wir-wee”.

**Habitat.** Forest edge, open and secondary forest with low undergrowth, light forest, scrub-jungle, lantana thickets, bamboo, small nullahs and hedgerows; at 245–2750 m.

**Food and Feeding.** Insects, occasionally berries. Found in parties of 8–10 individuals, often in association with other species, including other babblers, in mixed flocks. Usually forages close to or on ground; rarely ascends trees, to 3–4 m.

**Breeding.** Apr–Aug. Nest a fairly deep cup or loose dome, made of dry grasses, dead leaves, woody stalks and plant fibres, lined with fibres, fine grasses, pine needles and black hair (sometimes unlined), placed up to 1.5 m (usually less than 0.6 m) above ground in bush. Clutch 3–4 eggs, white, lightly speckled and spotted with reddish-brown, pinkish-red or brick red, rarely unmarked. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Frequent but very local in Pakistan. Fairly common in Nepal from W to EC area, rare farther E. Fairly common in India, where seen intermittently in Rajaji National Park (Uttar Pradesh), and fairly common on New Forest campus at Dehra Dun, common in Dehra Dun valley, and common in Corbett National Park (Uttaranchal Pradesh).

**Bibliography.** Ali & Ripley (1971), Gaston *et al.* (1994), Grimmett *et al.* (1998), Hume & Oates (1889), Inskipp & Inskipp (1991), Koelz (1954), Martens & Eck (1995), Mohan (1997), Pandey *et al.* (1994), Probsting (1964), Rasmussen & Anderton (2005), Singh (2000), Tymstra (1993).

## 94. Rufous-capped Babbler

### *Stachyridopsis ruficeps*

**French:** Timalie de Blyth **German:** Rotkopftimalie **Spanish:** Timalí Coronirrojo  
**Other common names:** Red-headed/Rufous-crowned Babbler

**Taxonomy.** *Stachyris ruficeps* Blyth, 1847, Darjeeling, India.

Genus formerly merged with *Stachyris*. Geographical variation slight; some races possibly not tenable. Individuals of this genus observed in C Laos may belong with nominate race of present species or with race *insuspecta* of *S. rufifrons*; further study required. Seven subspecies recognized.

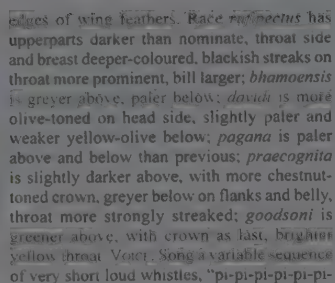
#### Subspecies and Distribution.

- S. r. ruficeps* (Blyth, 1847) – E Nepal E to NE India (E Arunachal Pradesh) and adjacent S China (SE Xizang).
- S. r. ruficeps* (Koelz, 1954) – E Arunachal Pradesh S to Nagaland, N Manipur and S Assam (N Cachar), in NE India.
- S. r. bharnensis* Harington, 1908 – NE Myanmar and S China (W & NW Yunnan).
- S. r. davidi* Oustalet, 1899 – C & SE China (S Shaanxi S to C Sichuan and S & E Yunnan, E to Zhejiang and Guangdong), NW Laos and N Vietnam (Tonkin).
- S. r. goodsoni* Rothschild, 1903 – Hainan I.
- S. r. praecognita* (Swinhoe, 1866) – Taiwan.
- S. r. pagana* Riley, 1940 – S Laos and S Vietnam (C & S Annam).

**Descriptive notes.** 12 cm; 7–12 g. Small, sharp-billed, pale olive and yellowish-buff babbler with rufous crown. Nominate race has crown and nape bright rufous, upperparts and neck side slightly greyish-olive, upperwing and tail a shade browner; face (lores, supercilium, ear-coverts) paler olive; yellowish-buff below, chin and throat with fine dark shaft streaks (sometimes invisible), lower belly, flanks and vent shading to buffy olive-brown; iris red or crimson, sometimes tinged rufous; bill blackish or brownish, lower mandible somewhat paler; legs greenish-brown to yellowish-grey. Sexes similar. Juvenile is rather less olive above than adult, crown paler, faint rufous

On following pages: 95. Rufous-fronted Babbler (*Stachyridopsis rufifrons*); 96. Visayan Miniature Babbler (*Micromacronus leytenensis*); 97. Mindanao Miniature Babbler (*Micromacronus sordidus*); 98. Pin-striped Tit-babbler (*Macronus gularis*); 99. Bold-striped Tit-babbler (*Macronus bornensis*); 100. Grey-cheeked Tit-babbler (*Macronus flavicollis*); 101. Grey-faced Tit-babbler (*Macronus kelleyi*); 102. Stripe-headed Tit-babbler (*Macronus striaticeps*); 103. Fluffy-backed Tit-babbler (*Macronus pilosus*); 104. Chestnut-capped Babbler (*Timalia pileata*).





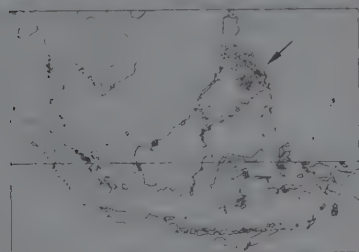
**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Birand & Pawar (2004), Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Choudhury (2003), Collar (2006), Cook (1913), Danielsen & Heegaard (1995), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Duckworth & Kersh (1988), Duckworth *et al.* (1997), Eames *et al.* (2001), Engelbach (1932), Garthwaite & Ticehurst (1937), Gönner (2006), Gore (1968), Grimmelt *et al.* (1998), Harrison (1984, 1987), Holmes (1996), Holmes & Burton (1987), Hopwood & Mackenzie (1917), Hume & Davison (1878), King *et al.* (2001), Koelz (1954), Lekagul & Round (1991), van Marle & Vooos (1988), Medway & Wells (1966), Nguyễn Duc Tu *et al.* (2001), O'Brien & Kinnaird (1999), Rasmussen & Anderson (2005), Robinson (1928), Robson (2000), Robson *et al.* (1998), Sharpe (1889), Sheldon *et al.* (2001), Singh (1995), Smith *et al.* (1940, 1943), Smythies (1986), Smythies & Davison (1999), Spierenburg (2005), Stanford & Mayr (1941), Stevens (1923), Stresmann & Heinrich (1940a), Thewlis *et al.* (1996), Thompson (1966), Ticehurst (1933), Tizard *et al.* (1997), Tordoff *et al.* (2002), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

**Subspecies and Distribution.**  
*S. r. ambigua* Harington, 1915 - N & E India (Sikkim and N West Bengal & throughout NE states; N Eastern Ghats in E Orissa and NE Andhra Pradesh), Bhutan, E Bangladesh, and NW Myanmar.  
*S. r. planicollis* (Mayr, 1941) - S part of N Myanmar; probably also W Yunnan, in S China.  
*S. r. pallescens* Titcherist, 1932 - W Myanmar.  
*S. r. rufifrons* (Hume, 1873) - SE Myanmar (including N Tenasserim) and NW & W Thailand.  
*S. r. adjuncta* (Deignan, 1939) - N Thailand, N & C Laos and N Vietnam (W Tonkin, N Annam).  
*S. r. obscura* (Stuart Baker, 1917) - S Thailand.  
*S. r. sumatrensis* (Hume, 1890) - Peninsular Malaysia, Sumatra and N & C Borneo.  
*S. r. borneensis* (J. basen, 1939) - W Borneo.

**French:** Timalie miniature **German:** Leyte-Laubsängertimalie **Spanish:** Timali Enano de Visayan  
**Other common names:** Leyte Tit-babbler, Miniature Babbler, Tit-babbler (when treated as conspecific with *M. sordidus*)



**Taxonomy.** *Micromacronus leytenis* Amadon, 1962, Dagami, 1500 feet [c. 460 m], Barrio of Patok, eastern shoulder of Mount Lobu, Leyte, Philippines. Formerly treated as conspecific with *M. sordidus*. Monotypic.  
**Distribution.** Samar, Biliran and Leyte, in EC Philippine Is.



**Descriptive notes.** 7–8 cm. Tiny babbler with bright yellow supercilium and underparts, and whitish spiny feathers projecting beyond tail from flanks and back. Male has crown and upperparts bright olive-green, crown feathers with indistinct black tips, lower back, rump and rear flanks with elongate, almost bare brown-tipped white shafts 4–4.5 cm in length; upperwing and tail dark brown with bright olive-green outer vanes; long supercilium from bill base bright yellow, lores, cheeks and ear-coverts olive-green, submoustachial area mottled olive on yellow; bright yellow below, thighs partly dusky; iris red; bill black; legs

greenish-grey, feet straw-yellow. Female is similar to male, but duller yellow. Juvenile apparently undescribed. **Voice.** No information.

**Habitat.** Undergrowth and canopy of montane broadleaf evergreen forest and forest edge; only published elevation 500 m.

**Food and Feeding.** Presumably small invertebrates; perhaps also small fruits. Found in small groups, often associating with other species, including white-eyes (*Zosterops*) and flowerpeckers (*Dicaeum*). Flock from which type series taken was feeding 15 m up on tall flowering tree; birds noisy and active, moving rapidly from branch to branch.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *M. sordidus*, listed as Data-deficient; formerly considered Vulnerable. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Records of this species are extremely few, and it is unclear what effect the widespread deforestation of its native islands have had on its populations.

**Bibliography.** Amadon (1962), Anon. (2006d), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Dickinson *et al.* (1991), Kennedy *et al.* (2000), duPont (1971), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 97. Mindanao Miniature Babbler

### *Micromacronus sordidus*

**French:** Timalie de Mindanao

**Spanish:** Timali Enano de Mindanao

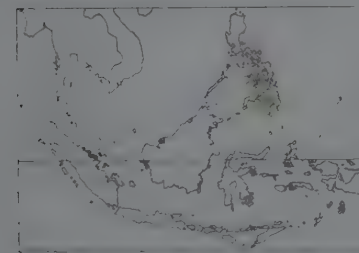
**German:** Mindanao-Laubsängertimalie

**Other common names:** Miniature Babbler/Tit-babbler (when treated as conspecific with *M. leytenis*)

**Taxonomy.** *Micromacronus leytenis sordidus* Ripley and Rabor, 1968, mountains of south Mindanao, Philippines.

Formerly treated as conspecific with *M. leytenis*. Monotypic.

**Distribution.** Mindanao, in S Philippine Is.



**Descriptive notes.** 7–8 cm; 5.5 g. Resembles *M. leytenis*, but slightly larger in size, with slenderer paler bill and shorter elongated back and flank plumes. Plumage much duller overall, without any bright yellow tones, being a shade duller and greyer above, pale yellowish-grey to greenish-olive below, with grey-green lores, rather pale in centre, dark olive supercilium concolorous with crown; iris and leg colours probably as in *M. leytenis*, bill horn-grey. Sexes similar. Juvenile is buffier above than adult, with warm cinnamon edges of wing feathers and shorter dorsal shafts, dull whitish below. **Voice.** No information.

**Habitat.** Undergrowth and canopy of montane broadleaf evergreen forest, at 600–1670 m.

**Food and Feeding.** Presumably small invertebrates; perhaps also small fruits. Seen to forage in canopy of montane forest with flock of Mountain Leaf-warblers (*Phylloscopus trivirgatus*).

**Breeding.** Males in breeding condition in May–Jun and recently fledged young in Jun. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *M. leytenis*, listed as Data-deficient; formerly considered Vulnerable. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Recorded in Mount Apo and Mount Kitanglad National Parks; ecological requirements, however, so poorly known that it is unclear what effect deforestation in much of the species' lower range may have had on its ability to survive.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Dickinson *et al.* (1991), Kennedy *et al.* (2000), duPont (1971), Ripley & Rabor (1968), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## Genus *MACRONUS* Jardine & Selby, 1835

## 98. Pin-striped Tit-babbler

### *Macronus gularis*

**French:** Timalie à gorge striée **German:** Strichelmeisentimalie **Spanish:** Timali Goliestriado

**Other common names:** Yellow-breasted Babbler/Tit-babbler, Striated/Striped/Stripe-throated Babbler/Tit-babbler

**Taxonomy.** *Timalia gularis* Horsfield, 1822, Sumatra.

Original description of genus included two different spellings of name (*Macronus*, *Macronous*); current name determined by ICZN Principle of First Reviser (see page 78). Formerly treated as conspecific with *M. bornensis*. Geographically isolated Philippine race *woodi* distinctive, and perhaps better treated as a separate species or, conceivably, as conspecific with *M. kelleyi*, with which (along with *M. flavicollis*) it shares song type. Many races weakly differentiated, and published diagnoses often based on trivial differences and not always supported by museum evidence; number of races probably too high, and several may in due course be synonymized. Fourteen subspecies currently recognized.

#### Subspecies and Distribution.

*M. g. rubicapilla* (Tickell, 1833) – Nepal, Bhutan, NE & EC India and Bangladesh.

*M. g. ticehursti* (Stresemann, 1940) – W & SW Myanmar.

*M. g. sulphureus* (Rippon, 1900) – N, E (except extreme E part) & SE Myanmar (including N Tenasserim), NW & W Thailand and S China (SW Yunnan).

*M. g. lutescens* (Delacour, 1926) – NE Myanmar, extreme NW & NE Thailand, S China (SE Yunnan, SW Guangxi), Laos and N Vietnam (Tonkin, N Annam).

*M. g. kinneari* (Delacour & Jabouille, 1924) – C Vietnam (C Annam).

*M. g. saraburiensis* Deignan, 1956 – EC Thailand and W Cambodia.

*M. g. versuricola* (Oberholser, 1922) – E Cambodia and S Vietnam (S Annam, Cochinchina).

*M. g. chondorensis* (Robinson, 1920) – Con Son I, off S Vietnam.

*M. g. connectens* (Kloss, 1918) – extreme S Myanmar (S Tenasserim) and adjacent SW, SC & SE Thailand.

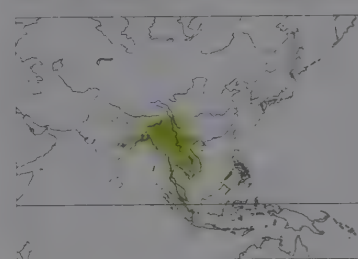
*M. g. archipelagicus* (Oberholser, 1922) – Mergui Archipelago, off SW Tenasserim (Myanmar).

*M. g. inveteratus* (Oberholser, 1922) – coastal islands off SE Thailand and adjacent Cambodia.

*M. g. chersonesophilus* (Oberholser, 1922) – S Thailand and N Peninsular Malaysia.

*M. g. gularis* (Horsfield, 1822) – S Peninsular Malaysia S to Sumatra (including Banyak I and Batu Is).

*M. g. woodi* (Sharpe, 1877) – Palawan and Balabac, in W Philippine Is.



**Descriptive notes.** 11 cm; 10–14 g. Small, strong-billed babbler, brown above with chestnut crown, pale yellow below with narrow black breast streaks. Nominative race has crown dull chestnut, paler on nape, and slightly paler rufescent-brown upperparts, upperwing and tail; lores buffy, shading to grey-tinged pale yellow on supercilium and ear-coverts, these divided by narrow brownish eyestripe; chin, throat, submoustachial area and breast pale yellow with sparse long blackish shaft streaks, belly pale yellow, flanks, thighs and vent washed olive; iris yellowish-white to greyish-brown, orbital skin bluish-lead; bill slaty, lower

mandible paler; legs pale greyish-olive. Sexes similar. Juvenile is whiter below than adult, with weaker streaking. Race *connectens* differs from nominate in being slightly more olive above, with stronger yellow supercilium and slightly weaker breast streaks; *versuricola* is similar to previous but slightly larger, and darker above, more heavily streaked on lower underparts, with darker, greyer flanks; *inveteratus* is also similar but larger, paler and less rufescent above; *chondorensis* is also similar, but forecrown more chestnut, upperparts darker; *archipelagicus* is also larger, paler and more greyish above, paler on flanks; *chersonesophilus* is likewise larger, darker above, flanks darker, with broader streaks on throat (roughly intermediate between nominate and *chondorensis*); *rubicapilla* is much paler and more olive above than nominate, crown tinged rufous, wings and tail pale olive-brown, supercilium and ear-coverts pale yellow, breast streaks weaker; *ticehursti* is similar to last, but cap more rufous, underparts more extensively yellow; *sulphureus* is brighter yellow on face to breast, breast streaks finer; *lutescens* is brighter yellow still, with darker olive tinge on flanks, slightly darker cap, darker mantle; *kinneari* resembles previous but slightly more rufescent above, slightly bolder breast stripes; *saraburiensis* differs from *lutescens* in duller crown, paler mantle, from *sulphureus* in duller and darker crown and mantle, from both in having greyer wash on flanks; *woodi* is distinctive, differs from nominate in having crown chestnut-greyish, face greyish, mantle, back and scapulars dark greyish, underparts much paler, breast streaks almost absent.

**Voice.** Song varies somewhat. In N Vietnam repeated loud clear bouncing “ti chut-chutut-chut” or “tit-chutut-chutut-chutut...”, in C Annam and Thailand an even, well-spaced series of 4–5 notes. “chut-chut-chut-chut” (or with longer interval after first note), in Indian Subcontinent a loud, repetitive series of identical percussive notes, “chaunk-chaunk-chaunk-chaunk...”, reminiscent of a tailorbird (*Orthotomus*); Palawan race *woodi* has an even, monotonous, weak, flat series of 5–27 bell-like “chu” or “choh” notes, repeated every 1–2 seconds, with occasional odd notes given between full bouts. Typical calls include harsh “chrrt-chrrt”, “chrrt-chrr-chrrt” and “titiiti-chreeroo”; call of *woodi* a low grumbling “cht’tt’tt’tt’ut’ut’...”; scolding “tseep” given once per second when mobbing Asian Drongo-cuckoo (*Surniculus lugubris*).

**Habitat.** Bushes and undergrowth in open broadleaf evergreen, deciduous and semi-evergreen forest, bushes and scrub on forest edge, logged areas, bamboo, long grass and brushwood; also swamp-forest, plantations, gardens, coastal scrub; locally mangroves and associated transitional habitats, e.g. in S Bangladesh (Sundarbans). Occurs at up to 1000 m in Indian Subcontinent and China; usually only to 800 m in Bhutan, with one record at 1800 m; to 1525 m in SE Asia and Palawan.

**Food and Feeding.** Insects, including small beetles (Coleoptera), caterpillars, ants (Formicidae), grasshoppers (Orthoptera), also spiders (Araneae); also some fruit. Parties of up to twelve or more individuals; singly or in pairs during breeding season. Often in mixed company with other species, including other small babblers. Forages usually near ground but climbs vine-laden trees, often 6–9 m above ground; occasionally feeds on ground. Creeps and clambers about in a more unobtrusive manner than do many *Stachyris* and *Stachyridopsis* babblers.

**Breeding.** Feb–Jul generally; Dec–Aug in Peninsular Malaysia; nest and egg in Apr, dependent young in mid-Aug and mid-Oct, and nest-building in Sept in Sumatra; breeding-condition birds in Apr and May and nest in Jun in Philippines (Palawan). Nest, built by both sexes, a ball or rough dome, entrance at front or side (often near top), made of dead bamboo, bark strips or other leaves, grasses, palm strands, debris and plant fibres, sparsely lined with fine grasses, fine stalks, fine fibrous rootlets and fibres (or unlined), placed 0.3–3 m (sometimes to 4.6 m) above ground in bush, stemless palm, bamboo clump, hedge, pineapple plant, among ferns or other low vegetation, among mass of vines or mass of orchids hanging from tree, or on overgrown stump. Clutch 2–5 eggs (usually 3–4 in India and Myanmar, 2–3 in S regions and Palawan), white to dull white (sometimes with very faint pinkish tinge) with small blotches and specks of purplish-brown to yellowish-brown and/or brick-red. No information on incubation and nestling periods.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common across range. Frequent from W to C Nepal, common E from C Nepal. Frequently recorded in foothills of Bhutan, most regularly in E above Samdrup Jongkha, with up to 35 recorded per day. Common in India: common



**Descriptive notes.** 14 cm. Crown is dull rufous, shading to slightly grey-tinged brown on mantle and to dull rufous-tinged brown on remaining upperside; upperwing and tail: face (lores, narrow short supercilium, ear-coverts and cheek) and neck side pale grey, submoustachial area pale grey (with vague narrow dark flecks); chin, throat and breast very pale yellowish with very narrow sparse blackish-narrow shaft streaks, remaining underparts plain grey-tinged pale yellow; iris pale yellow to amber; bill blackish; legs yellowish-brown. Distinguished from very similar *M. gularis* by having supercilium and head side grey, crown more uniform with upperparts, underparts paler and barely streaked. Sexes similar. Juvenile has greyer underparts with diffuse narrow dark throat streaks. Voice.—Song a soft, even, fairly well-spaced series of 2–20 notes (usually c. 8–12), "tuh-tuh-tuh-tuh-tuh-tuh-tuh". Calls include harsh "chrrrri-chrrruu-chrrrii-chru", "chrrree-chrrrr" and "chi-i-chrrrr", coarse "wi-ti-u-euu" and hoarse squeaky "trrrrt trrrtt...".







*T. p. pileata* Horstfield, 1821 - W Java.

**Descriptiv notes.** 15.5–17 cm; 15–23 g. Medium-sized babbler with rather long graduated tail, thick black bill, black half-mask, white face and breast and chestnut cap. Nominative race has forehead and supercilium whitish, crown chestnut, upperparts and upperwing pale olive-brown with rufescent tint, vague blackish streaks on mantle, tail greyer olive-brown with indistinct narrow brownish bars; lores to bill base and area immediately around eye, including narrow postocular eyestripe (separating supercilium from rest of face), black, ear-coverts whitish, neck side and breast side mid-grey; lower face, chin and upper throat

white, lower throat to breast white with fine black shaft streaks, belly pale creamy buff, flanks, thighs and vent dirty ochrous olive-brown; iris reddish-brown to crimson; bill black; legs dark brown, brownish-grey or brownish-olive. Sexes similar. Juvenile is warmer above than adult, with brown duller, no black streaks on breast, iris brownish-grey. Race *bengalensis* is darker above than nominate, only slightly rufescent, tail blackish-brown, belly pale olivaceous-buff; *smithi* is ep rufescent brown above and deep rufescent-buff on belly, both darker than any other race, tail rufescent dark brown; *intermedia* is rufescent-brown above, much paler than previous two, tail rufescent dark brown, belly rufescent buff; *patriciae* is pale olivaceous-brown above, tail dark brown, belly pale rufescent buff; *dictator* is pale rufescent brown above, tail rufescent dark brown, belly as last. Voice. Songs include sudden husky phrases ending with thin metallic notes, "wher-wher witch-it-it", "wher-er-itch-it-it" and similar, often by more than one bird at a time; also as "tseén-weer-krich-richrichit"; another version is loud musical whinny, evenly and rapidly descending, "tweér-r'r'r'r'r'r'r'r'r'r", fading and less musical near end. Calls include short, loud, stony, metallic "tizi" or "stik" notes, and harsh "chrrt" notes and varied low chuntering grumbles.

**Habitat.** Low-lying swampy areas, tall grass (including *Saccharum*), reedbeds, brushwood and scrub-jungle, often along streams and roads, also patches of *Eupatorium odoratum* and similar heavy cover in damp open areas, low bushes, thorn hedges and bamboo between cultivation; *Phoe-*

*nix paludosa* bushes in mangrove forest. At up to 1500 m in India, SE Asia and Java; 340–880 m in China.

**Food and Feeding.** Caterpillars, beetles (Coleoptera) and other insects and their eggs. Found in pairs during breeding season; otherwise in small parties of up to 6-8 individuals, often in association with *Chrysomma sinense*. Keeps low down in vegetation.

**Breeding.** Feb–Oct in India and Apr–Sept in SE Asia; probably multi-brooded. Nest, built by both sexes, described as a rough ball, oval or dome, with rather large entrance at side, or sometimes a deep cup, made of dry coarse grasses, straw, dry bamboo or other leaves and rootlets, scantily lined with fine grasses and rootlets (or unlined), placed up to 1 m above ground low down in bush or sapling, invariably surrounded by long grass, on spikes protruding from grass nodes, or on ground sheltered by bush or grass tussock. Clutch 2–5 eggs (usually 3–4 in India and Myanmar, 2–3 in Java), white (rarely pinkish), thickly speckled or finely blotched with various shades of brown and with little spots and clouds of pale ink-purple or dark ink-grey, in Java described also as pale grey with dark red speckles. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon in Nepal except in Royal Chitwan National Park, where common. Locally common in India, where common in Dudhwa National Park (Uttar Pradesh), Bhitarkanika Wildlife Sanctuary (Orissa) and Dibru-Saikhowa and Kaziranga National Parks (Assam), and present in Ngengpui Wildlife Sanctuary (Mizoram) and Buxa Tiger Reserve (West Bengal). Local in Bangladesh. Common in China, where recently found in Qinglongshan and Shiwandashan Nature Reserves, in Guangxi. Generally common in SE Asian range. In Laos, present but evidently uncommon in Xe Pian National Biodiversity Conservation Area (NBCA), Phou Xang He, Phou Xiang Thong and Dong Hua Sao NBCAs, but common in Phou Dendin NBCA. Uncommon in Cuc Phuong National Park, present in seven protected areas in the Annamese lowlands, and common in Nam Bai Cat Tien National Park, in Vietnam. Historically recorded from area of Gunung Gede-Pangrango National Park, and present in Ujung Kulon National Park, in W Java.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Andrew (1985), Barua & Sharma (1999), Birand & Pawar (2004), Chasen (1939), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Christison *et al.* (1946), David-Beaulieu (1932, 1939, 1944, 1950), Davidson (1998), Davidson *et al.* (1997), Deignan (1955, 1963), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames *et al.* (2001), Engelbach (1932), Evans *et al.* (2000), Grimmer *et al.* (1998), Hoogerwerf (1950a, 1971), Hoogerwerf & Rengers Hora Siccama (1938), Hopwood (1912), Hume (1880), Hume & Davidson (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Javed & Rahmani (1998), Kinnear (1929), La Touche (1923, 1925–1930), Lê Mạnh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lister (1954), Löfling (1984), MacKinnon (1988), Mayr (1938), Meyer de Schauensee (1984), Neath (2001), Oates (1883), Pandav (1997), Rasmussen & Anderton (2005), Ripley (1952, 1982), Rippon (1901), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Rosevear (1950), Singh (1995), Smythies (1986), Stanford & Mayr (1941), Stanford & Titcherth (1930), Stressemann & Heinrich (1940a), Thewlis *et al.* (1996), Tizard *et al.* (1997), Tordoff *et al.* (2002), Turin *et al.* (1987), Wang Shuzhen *et al.* (1983), Wu Zhikang *et al.* (1986).

PLATE 9





PLATE 9

3 inches  
8 cm

## PLATE 9

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *PTYRTICUS* Hartlaub, 1883

#### 105. Thrush-babbler

##### *Ptyrticus turdinus*

**French:** Akalat à dos roux **German:** Weißbauch-Drosseltimalie **Spanish:** Tordina Moteada  
**Other common names:** African Thrush-babbler, White-bellied Babbler, Jonjon

**Taxonomy.** *Ptyrticus turdinus* Hartlaub, 1883, Tomaya (4°38' N, 29°50' E), Sudan. Appears most closely related to genus *Illadopsis*. A pair of this species from E Central African Republic believed to belong in nominate race. Three subspecies recognized.

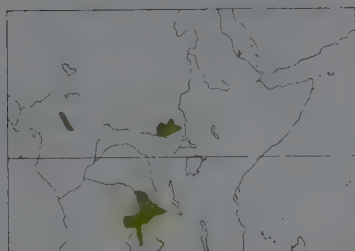
##### Subspecies and Distribution.

*P. t. harti* Grote, 1921 – C & E Cameroon.

*P. t. turdinus* Hartlaub, 1883 – extreme S Sudan, NE DR Congo; one record (probably this race) from E Central African Republic.

*P. t. upembae* Verheyen, 1951 – SE DR Congo, extreme E Angola and NW Zambia.

**Descriptive notes.** 16.5 cm; 59–73 g. Resembles large *Illadopsis* but song and underparts very different; rather long, straight and slightly hooked bill, powerful legs. Nominative race has forehead rufous centrally, whitish laterally, crown to mantle and neck side rufous, scapulars and back rufescent brown, uppertail-coverts bright rufous, tail brown with rufous fringes basally; lores, chin and throat white, cheek and ear-coverts mottled white and rufous, and small rufous teardrops at side of throat; breast white with rufous-brown triangular spots, belly to vent white, flanks white with rufous-brown marks; iris reddish to brownish-grey; upper mandible blackish with bluish-grey tip, lower mandible pale blue-grey; legs pale pinkish-grey. Sexes similar. Juvenile has brownish-black bill with yellowish-green lower base; rather deeper rufous above, especially on tail and outer webs of flight-feathers. Race *harti* is brighter rufous on tail than



babble. Low clucking calls, e.g. "chuck", given in agitation; loud cackling and chattering also reported.

**Habitat.** Dense bush and grass thickets along edge of forest streams, undergrowth in gallery forest, moist evergreen riparian forest, lowland damp woodland and thickets. To 900 m in Cameroon and NE DR Congo, and to 1600 m in SE DR Congo.

**Food and Feeding.** Invertebrates, including beetles (Coleoptera), grasshoppers (Orthoptera), caterpillars, cicadas (Cicadidae), small ants (Formicidae), termites (Isoptera), spiders (Araneae) and snails; also tiny frogs. Found in pairs or in small parties up to six individuals. Forages in undergrowth; strong legs suggest habitual terrestrial foraging, but only one such report to date.

**Breeding.** By inference, Jun–Nov in NE and Oct–Dec in S in DR Congo; birds in breeding condition in Feb in Angola; young juvenile in Oct in Zambia. No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon to locally fairly common in Cameroon, Central African Republic and Sudan; present in Upemba National Park, in DR Congo; uncommon in Angola. Does not occur in any protected area in Zambia, and all known sites for this species subject to worrying levels of deforestation.

**Bibliography.** Bannerman (1953), Benson (1958), Benson *et al.* (1971), Borrow & Deme (2001), Cave & Macdonald (1955), Chapin (1953), Fry *et al.* (2000), Hall & Moreau (1970), Lippens & Wille (1976), Louette (1981), Mitsch (1973), Nikolaus (1987), Oatley (1969).

## Genus *ILLADOPSIS* Heine, 1860

### 106. Black-capped Illadopsis

#### *Illadopsis cleaveri*

**French:** Akalat à tête noire **German:** Augenbrauen-Buschdrossling **Spanish:** Tordina Capirota  
**Other common names:** Blackcap Thrush-babbler/Akalat/Illadopsis

**Taxonomy.** *Drymocapthus cleaveri* Shelley, 1874, Fanti region, Ghana.

Formerly placed in genus *Trichastoma*. May form a superspecies with *I. albipectus*; occasionally treated as conspecific, but plumages distinctive and ranges parapatric. Individuals of this species in Ivory Coast and SE Guinea not yet assigned to race. Five subspecies recognized.

**Subspecies and Distribution.**

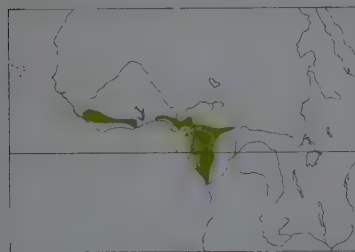
*I. c. johnsoni* (Büttikofer, 1889) – E Sierra Leone and W Liberia.

*I. c. cleaveri* (Shelley, 1874) – Ghana.

*I. c. marchanti* Serle, 1956 – SE Benin and S Nigeria.

*I. c. batesi* (Sharpe, 1901) – SE Nigeria (Obudu Plateau) and SW & S Cameroon E to SW Central African Republic, S to extreme W DR Congo.

*I. c. poensis* Bannerman, 1934 – Bioko I (Fernando Pó).



**Descriptive notes.** 15–16 cm; 22–36 g. Black cap and long pale eyebrow distinctive. Nominative race has crown blackish, hindneck grey, upperparts and head side bright rufous-brown, tail dark russet-brown; long, broad supercilium whitish-grey, cheek and ear-coverts blackish, neck side grey; chin to belly whitish, moustachial stripe greyish, breast side, flanks and undertail-coverts as upperparts; iris chestnut-brown; bill black; legs pinkish. Sexes similar. Juvenile is more rufous on breast and flanks, with dusky mottling below. Race *johnsoni* is darker than nominate, with less rufous upperparts, greyish wash on breast;

*poensis* is like previous but upperparts darker, with blackish barring on mantle and scapulars, darker breast side and flanks; *batesi* has slightly less blackish crown and ear-coverts, greyer supercilium, brownish breast wash; *marchanti* has dark olive-grey crown, less distinct (buffish) supercilium, brown-washed breast. **Voice.** Song, given all year (mainly in poor light at dawn, and in Gabon less intensively in long dry season Jun–Sept), consists of 1–2 resonant far-carrying whistles, usually introduced by 1–2 short quiet notes, "ptk whit whú whééé", very like that of *I. albipectus*; also a faster, rising series of 3 whistles introduced by 1–2 short notes, "whit whú-whéé-whifff", endlessly repeated. Alarm call "chk chk chk...", like that of *I. fulvescens* but louder; contact call a dry "prrr prrr...".

**Habitat.** Dense undergrowth and more open understorey of primary and mature secondary forest, *Raphia* swamp-forest, logged forest, forest-shrub mosaic, sometimes coffee groves; avoids pure stands of arrowroot (Marantaceae). Sea-level to 1500 m in Liberia (Mt Nimba) and Nigeria, to 1850 m in Cameroon (Mt Cameroon).

**Food and Feeding.** Invertebrates, including termites (Isoptera), small beetles (Coleoptera), crickets (Orthoptera), spiders (Araneae), millipedes (Diplopoda) and small snails. Forages on or near forest floor, rarely higher than 2 m; scratches in leaf litter and debris by fallen logs and tree bases,

inspects stems of broadleaved grasses and arrowroots. Found singly or in pairs, very rarely in larger parties, but sometimes joins bird waves and readily follows driver-ant columns.

**Breeding.** May–Nov in Liberia and Nigeria, Jan–Feb in Ivory Coast, all year in Cameroon, and Jan–Mar and Nov in Gabon; fledging in Feb on Bioko. Nest a large loose shallow cup, made of dead leaves with a few stems and rootlets, lined with *Murasmus* strands, placed on bed of leaves on ground, under bush covered with foliage or in low undergrowth, occasionally up to 0.6 m above ground. Clutch 2 eggs, white or pinkish-white with dull maroon and dark purplish-grey spots and markings or stronger reddish-brown markings; incubation by female only; no information on duration of incubation and nestling periods. Nests possibly parasitized by Red-chested Cuckoo (*Cuculus solitarius*). From seven clutches monitored, only one young fledged; one clutch was infertile, others probably preyed on.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally fairly common across range. Fairly common to common in Liberia, at coast and throughout forest zone; present in Tai Forest National Park, in Ivory Coast, and Bia and Kakum National Parks, in Ghana, being common in latter. Uncommon in S Nigeria. Present in Korup National Park and Lobeke Reserve, in Cameroon. Uncommon in Dzanga-Ndoki National Park, in Central African Republic; common in Gabon, where density 12–14 pairs/km<sup>2</sup>, and common in Odzala and Nouabalé-Ndoki National Parks, in PR Congo; last-mentioned, Dzanga-Ndoki and Lobeke form a continuous block.

**Bibliography.** Allport *et al.* (1996), Bannerman (1953), Borrow & Deme (2001), Brosset & Éard (1974, 1986), Chapin (1953), Colston & Curry-Lindahl (1986), David & Gosselin (2002b), Deme & Fishpool (1994), Dowsett-Lemaire (1997b), Dowsett-Lemaire & Dowsett (1991, 2000), Eisentraut (1973), Elgood *et al.* (1994), Fry *et al.* (2000), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Louette (1981), Meise (1978), Rand *et al.* (1959), Rodewald *et al.* (1994), Serle (1954, 1957), Stuart (1986), Willis (1983).

### 107. Scaly-breasted Illadopsis

#### *Illadopsis albipectus*

**French:** Akalat à poitrine écaillée

**Spanish:** Tordina Pechiescamada

**German:** Schuppenbrust-Buschdrossling

**Other common names:** Scaly-breasted Thrush-babbler

**Taxonomy.** *Turdinus albipectus* Reichenow, 1887, Stanley Falls, DR Congo.

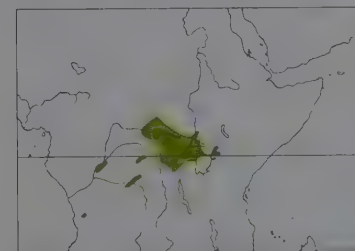
Formerly placed in genus *Malacocincla*. May form a superspecies with *I. cleaveri*; occasionally treated as conspecific, but plumages distinctive and ranges parapatric. Three subspecies recognized.

**Subspecies and Distribution.**

*I. a. barakae* (F. J. Jackson, 1906) – SE Central African Republic, NE DR Congo, extreme S Sudan, W & SW Uganda and W Kenya.

*I. a. albipectus* (Reichenow, 1887) – W & NC DR Congo.

*I. a. trensei* (Meise, 1978) – NW Angola.



**Descriptive notes.** 14 cm; 25–38 g. Nominative race has crown dark greyish-olive with darker scaling, upperparts, including upperwing, dark rufescent brown, tail dark brown; lores and cheek grey, latter with whitish mottling; narrow indistinct supercilium pale grey, ear-coverts olive-grey, becoming paler on neck side; chin and throat greyish-white, upper breast pale grey with vague olive tinge and sometimes vague dark scaling, lower breast and belly whitish, breast side, flanks and thighs olive-grey; iris brown to reddish-brown; upper mandible blackish, lower mandible pale grey; legs pale pinkish-grey. Distinguished from very

similar *I. rufipennis* by breast scaling (if present), less defined breastband, longer and paler legs, shorter rectral bristles, but mainly by voice. Sexes similar. Juvenile is more rufous above than adult, breast brownish, with rufous feathers above and around eye. Race *barakae* is browner on crown than nominate, paler grey on head side, narrower supercilium; *trensei* is paler and, on average, larger than other two. **Voice.** Song, throughout year, variable, apparently geographically. In Kakamega Forest (Kenya) and Kibale Forest (Uganda), consists of introductory "tip" and "tip" notes (sometimes soft "wheel" 2 seconds beforehand) and 2–3 (mainly 3) lively ringing high-pitched whistles, in ascending semi-tones, "tip tp-weeee-weeee-weeee", lasting 2–2.5 seconds, but some renditions may be protracted, e.g. "wheel... twir... wheel... twit... twittwee-tweee-tweeee" (7–8 seconds; last note longest and loudest, audible to 200 m); commonly repeated every 5–35 seconds (usually every 6–16 seconds) for more than an hour. Also as subdued chattering that breaks into 2–3 slowly delivered rising notes, "tiu tu ti". Foraging birds, possibly immatures, gave loud, liquid, high-pitched, drawn-out "peeeep-peeeep", repeated about five times at intervals of c. 30 seconds. "Pishing" caused immature to respond with "tittittittittit... see-u see-u see-u" (soft twittering followed by high whistles).

**Habitat.** Dense ground cover and areas with good leaf litter in lowland primary forest, seasonal swamp-forest and transitional forest, from valley bottoms to ridgetops, reaching 1525 m in Sudan, 2000 m in Uganda, 1700–2100 m in Kenya. In study in Uganda, treefall gaps found to be important as foraging centres and key to abundance of species, territory density increasing with increasing availability of such gaps, with highest densities in well-logged forest (although birds in such habitat experience dry-season stress as conditions drier than in unlogged forest).

**Food and Feeding.** Invertebrates, including ants (Formicidae), small beetles (Coleoptera), worker and soldier termites (Isoptera), other insects and their eggs, caterpillars, millipedes (Diplopoda) and small snails. Forages mostly on ground, occasionally up to 2 m; flips over leaves and scratches ground with feet. Found singly, in pairs or in family parties; sometimes found near bird waves, but does not join them.

**Breeding.** Bird in breeding condition in Jun in Central African Republic; breeds all year in DR Congo, Aug–Nov in Sudan, and Mar–Jul, Sept and Nov–Dec in Uganda. Only one nest described, a loose shallow cup of brown, damp, rotting leaves, lined with dead leaves and a few rootlets, sheltered on one side by a large fallen leaf, and well concealed on damp ground in slight depression under small fern; territory may be only 0.8–1.2 ha. Clutch 2 eggs, white with pale to dark brown blotches; no information on incubation and nestling periods. Recorded longevity in Kenya (Kakamega) at least 8 years 3 months.



**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common in SE Central African Republic; abundant in Congo Basin of C DR Congo; uncommon in Imatong Mts. in SE Sudan. Widespread and locally common, sometimes very common, in W & S Uganda; abundant in Kakamega Forest, in Kenya. Conservation status of isolated population in NW Angola unknown.

**Bibliography.** Borrow & Demei (2001), Britton (1980), Butyński (1989), Carswell *et al.* (2005), Cave & Macdonald (1955), Chapin (1953), David & Gosselin (2002b), Dean (2000), Fry *et al.* (2000), Hall & Moreau (1970), Lewis & Pomeroy (1989), Lindsell (2001a, 2001b), Mann (1985), Meise (1978), Nikolaus (1987), Stevenson & Fanshawe (2002), Traylor & Archer (1982), Williams & Arlott (1980), Zimmerman *et al.* (1996).

**108. Rufous-winged Illadopsis***Illadopsis rufescens*

**French:** Akalat à ailes rousses

**Spanish:** Tordina Alirufa

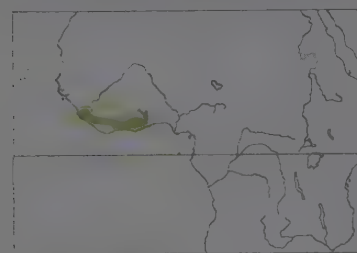
**German:** Rostschwingen-Buschdrossling

**Other common names:** Rufous-winged Akalat/Thrush-babbler

**Taxonomy.** *Turdiostris rufescens* Reichenow, 1878, Liberia.

Formerly often placed in genus *Trichastoma*. Monotypic.

**Distribution.** SW Senegal, SW Guinea, Sierra Leone, Liberia, S Ivory Coast, S Ghana and W Togo.



**Descriptive notes.** 16–17 cm; 32–41 g. Crown, upperparts and tail are rufous-brown, lores and head side paler brown, with vague buffy supercilium and whitish streaks on cheek; whitish below, pale brownish-grey tinge on breast and greyish flanks and vent; iris tawny-brown to dark brown; upper mandible black, lower mandible greyish or pinkish-horn with yellowish base; legs pale whitish-flesh. Distinguished from very similar *I. puveli* by greyer breast and flanks, lower mandible yellow only basally, but best separated by voice and habitat. Sexes similar. Juvenile apparently identical to adult.

**Voice.** Song, from high in trees (also from

ground), pleasant, simple, far-carrying and fast arrangement of 5–6 notes (several dry notes, a short whistle and 2 longer, louder, ringing whistles), “chk-chk-chk-hú-hú-hú” or “chit-chit-tu-hoo-hoo” or “tik tik tik pee pee-pee” (either all on one pitch or with first 3 notes higher), constantly repeated with only 1 second between deliveries. Alarm call a harsh, throaty “chk chk”, with rolling “churr” notes thrown in; also “whit-whit-whit”.

**Habitat.** Undergrowth in primary and old logged lowland broadleaf evergreen forest, often preferring rather open ground inside such forest, also dense high bush, sometimes disturbed farmbrush with forest remnants, forest edge, coastal thickets; rarely, plantations and logged forest. Found at 760–1220 m in Sierra Leone, and 535–1400 m in Liberia.

**Food and Feeding.** Beetles (Coleoptera), grasshoppers (Orthoptera), termites (Isoptera) and other insects; also small snails, and small amphibians. Forages close to or (mainly) on ground; turns over dead leaves, scratching them with feet, and hopping among ferns and other undergrowth. Found in pairs or family parties; sometimes joins bird waves.

**Breeding.** Bird in breeding condition in Apr and pair feeding young in Dec in Sierra Leone; food-carrying adult in Feb in Ivory Coast; breeding-condition birds all year, high song activity in Jun–Oct and newly independent juveniles in Nov–Jan in Liberia. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Upper Guinea Forests EBA. Generally uncommon to rare throughout range, and at risk from extensive destruction of forest; but can be common within good habitat. Only two records from Senegal, both in Basse Casamance National Park. In Sierra Leone, densities of calling birds in Gola Forest 2–6/6/km<sup>2</sup> in logged forest and 14–2–18–1/km<sup>2</sup> in primary forest; estimated total population in 1989 for Gola Forest North was 6392 individuals, and for Gola Forest East and West 3212. Locally common throughout forested parts of Liberia, reaching densities of 4–8 pairs/km<sup>2</sup>, and commonest illadopsis at Mt Nimba. In Ivory Coast, present in Taï Forest, Azagany and Marahoué National Parks and Nimba Nature Reserve. Fairly common in SW Ghana; rare in Togo, where only one confirmed record.

**Bibliography.** Allport (1991), Allport, Ausden, Fishpool *et al.* (1996), Allport, Ausden, Hayman *et al.* (1989), Anon. (2006d), Bannerman (1951, 1953), Barlow *et al.* (1997), Borrow & Demei (2001), Butchart & Stattersfield (2004), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Demei (1995), Dickerman *et al.* (1994), Fry *et al.* (2000), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Morel & Morel (1990), Serle (1949), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thiollay (1985).

**109. Puvel’s Illadopsis***Illadopsis puveli*

**French:** Akalat de Puvel

**German:** Großfuß-Buschdrossling

**Spanish:** Tordina de Puvel

**Other common names:** Puvel’s Akalat/Thrush-babbler

**Taxonomy.** *Turdinus puveli* Salvadori, 1901, Rio Cacine, Guinea-Bissau.

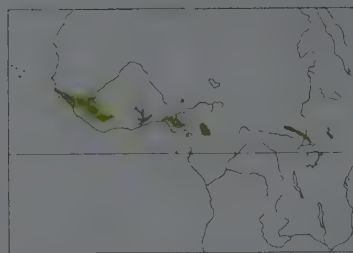
Often placed in genus *Trichastoma*. Two subspecies recognized.

**Subspecies and Distribution.**

*I. p. puveli* (Salvadori, 1901) – SW Senegambia S to Guinea-Bissau, Guinea, N Sierra Leone, N Liberia and W Ivory Coast, and SE Ghana and S Togo.

*I. p. strenuipes* (Bannerman, 1920) – C & S Nigeria, Cameroon, extreme NE DR Congo and adjacent S Sudan and W Uganda.

**Descriptive notes.** 17–18 cm; 38–52 g. Nominative race has crown rufous-tinged brown with vague dark mottling, upperparts, including upperside, rufous-brown, tail darker; lores and head side brown with vague buffy supercilium and whitish streaks on cheek; whitish below, with warm peachy buff across breast, breast side brown, flanks and vent rufous-buff; iris brown; upper mandible black to blackish-brown, lower mandible yellow; legs whitish-flesh. Sexes similar. Juvenile is deeper rufous than adult, with more rufous-brown on breast. Race *strenuipes* is darker above than nominate, with tinge of olive, darker on breast and flanks, thighs brown. Voice, Song, for which male will ascend into trees, usually of 3–8 semi-musical notes in quick succession and repeated monotonously with short intervals, first 3–4 notes higher than last 2–4, which are louder but descend in pitch, “chip chip chip chee chee chee” or “pit-chip-per-chip-per-chip hur hee” or “wit ti-ti-tu-tu too”, higher-pitched and slightly more varied than that of *I. rufescens*; also as a musical series of



explosive, hollow, variably paced rising and falling notes, “tink-tink ching ching chi ching”, song in Uganda similar in structure, but chirped more than whistled. Female noted as giving repeated downslurred “peeeeee” in aggression, perhaps same as the loud “peey-aaar” (context unknown) heard in Uganda; contact or distress calls of trapped birds involved 3–4 rising and falling notes, to which a free adult responded with a churr.

**Habitat.** Undergrowth in lowland gallery forest, thick farmbrush, riverine and ravine thickets, second growth and secondary scrub, forest–grassland mosaic and savanna, reaching

primary ridge forest at 1400 m and secondary vegetation up to 1500 m on Mt Nimba (Liberia). At Zwedru, in Liberia, found in new farmland (3–7 years old) and *Harungana* scrub at the airfield; in Cameroon restricted to forest–savanna ecotone; in Budongo Forest, in Uganda, found in shrub understorey of *Rinoria ilicifolia* below dense-canopied *Cynometra*.

**Food and Feeding.** Invertebrates, including ants (Formicidae) and spiders (Araneae). Spends much of its time in foraging on ground in leaf litter or just above it, running from one spot to another, scratching among dry leaves and jumping from ground to glean items from leaves. Found singly or in pairs, sometimes in association with other species in bird waves.

**Breeding.** Nov in Ivory Coast and Mar in Sudan; breeding-condition bird in Aug in Liberia and in Nov in DR Congo. One nest was a mossy cup 2 m off ground in fork of small tree; another a loose cup made of dry leaves, pieces of bark and grass, woven into base of twigs in hollow scratched in ground, under fallen branch in opening in dense forest; held two nestlings. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally uncommon to locally common across range. Reported occurrence of nominate race in Mali now considered erroneous. Rare in Gambia and Senegal; fairly common in Liberia along N borders; one of the most widespread babblers in Ivory Coast, where common in Comoe National Park. Rare, but possibly overlooked, in Togo. Uncommon in forest zone in Nigeria; present in Korup National Park (N section) and Kimbe River Game Reserve, in Cameroon. Fairly common in Bengangai Forest, in SW Sudan; locally common in Budongo Forest, in Uganda.

**Bibliography.** Allport *et al.* (1996), Bannerman (1953), Barlow *et al.* (1997), Borrow & Demei (2001), Carswell *et al.* (2005), Chapin (1953), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Dowsett-Lemaire & Dowsett (2005), Elgood *et al.* (1994), Fry *et al.* (2000), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Louette (1981), Morel & Morel (1990), Nikolaus (1987), Owijunji (2000), Plumtre & Owijunji (1997), Salewski (1997), Serle (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Traylor & Archer (1982), Wilkinson & Beccroft (1988).

**110. Pale-breasted Illadopsis***Illadopsis rufipennis*

**French:** Akalat à poitrine blanche

**Spanish:** Tordina Pechipálida

**German:** Grauungen-Buschdrossling

**Other common names:** Pale-breasted Thrush-babbler, White-breasted Akalat/Illadopsis

**Taxonomy.** *Trichastoma rufipennis* Sharpe, 1872, Gabon.

Was formerly often placed in genus *Malacocincla* or in *Trichastoma*. Has been thought to form a superspecies with *I. pyrrhoptera*, normally occurring at lower altitudes than latter in areas of sympatry in E of range. Race *distans*, differing from others in song and proportions, may represent a separate species. Birds from Pugu Hills (and Kazimzumbwi Forest Reserve), in Tanzania, sometimes separated as race *puguensis*, but considered better treated as part of *distans*. Four subspecies recognized.

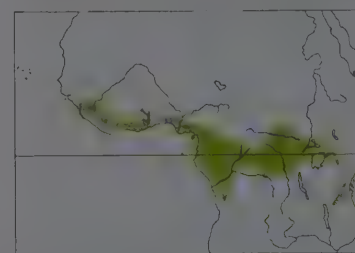
**Subspecies and Distribution.**

*I. r. extrema* (Bates, 1930) – Sierra Leone E to Ghana.

*I. r. rufipennis* (Sharpe, 1872) – S Nigeria E to Uganda, W & SW Kenya and extreme NW Tanzania, S to NW Angola and C DR Congo.

*I. r. bocagei* (Salvadori, 1903) – Bioko I (Fernando Póo).

*I. r. distans* (Friedmann, 1928) – NE Tanzania, including Zanzibar.



**Descriptive notes.** 14–15 cm; 18–32 g. Nominative race has crown, lores, cheek, upperparts and tail dark rufous-brown (crown sometimes greyer in E of range), very slight pale eyering, head and face side slightly greyish and olive; throat white and distinctly bearded (puffed out in excitement), breast conspicuously pale buffish-brown with slight suffusion of greyish-olive at side, belly whiter; iris brown to pale brown; upper mandible blackish to blackish-brown, lower mandible pale horn to pale grey; legs bluish-grey to brownish-grey. Distinguished from very similar *I. fulvescens* mainly by smaller size, shorter tail, domed

(rather than flattish) crown, more contrast between upperside and underside. Sexes similar. Juvenile is richer brown on upperparts than adult, head without greyish tinge, browner on flanks and breast, and buffier on throat and belly. Race *extrema* is slightly smaller and more rufous-tinged, particularly on head, than nominate; *bocagei* has longer bill, deeper colour; *distans* is longer-tailed and larger-billed, with breast to belly pale grey, flanks more olive-brown. Voice, Song, singly or as duet or trio, all year in Gabon (less intensively in long dry season), very variable, rendered in different parts of range (although extent to which these geographically fixed is unclear) as a slow, meditative “twip tyooow weep”, “tyooow toowee toowee”, “chip heeheeewi”, “tyooow woy-whyee”, “hooon-hooonooe”, “weeeeee” and rising “peeeeee”, such notes often accompanied by other birds giving continuous low chatter, sometimes rising in volume and pitch, “tuk-tuk-tuk-wik-wik-wik-week-week-week...”, very like songs of *I. albipennis*, *I. cleaveri* and *I. fulvescens*, but more “pinched”, less clear, than that of last. In W Africa, at least, a second song type is a short ascending series of 2–3 pure whistles, introduced and accompanied by short notes, e.g. “whit tew wuuuu whééé”, repeated constantly. In E Tanzania (race *distans*) a rising and falling explosive nasal “tyah tyah”. Much churring conversation among flock-members, other calls include low nasal “tyank-tyank-tyank...” for contact when foraging, grating “ka-a-a” followed by throaty “kwo-kwo” in alarm, noisy “tizz”, and high insect-like “he, whooo” monotonously repeated.



**Habitat.** Dense undergrowth in primary and secondary humid broadleaf lowland, transition and montane evergreen forest, moss forest (on Bioko, at least), logged forest, forest patches in grassland mosaics, farmbush, coastal thickets, dense bush in clearings and along tracks, overgrown fields and plantations, often in wetter patches supporting large-leaved Marantaceae and Zingiberaceae. Generally at 500–1525 m, but 1000–2300 m in Kenya and 1220–1700 m in Tanzania.

**Food and Feeding.** Small invertebrates and their eggs, including moths and caterpillars (Lepidoptera), crickets (Orthoptera), beetles including elaterid larvae (Coleoptera), earwigs (Dermaptera), immature pentatomid bugs, ants (Formicidae), woodlice (Isopoda), centipedes (Chilopoda), spiders (Araneae) and small snails; nestlings provisioned with caterpillars and other larvae, and small crickets. Forages on or close to ground, below 5 m (usually below 0.3 m up, occasionally to 12 m), usually lower than *I. fulvescens*. Moves steadily through undergrowth, often in association with other species in bird waves, turning over leaves and debris in search of food; also on branches and trunks of trees and saplings, among lianas and Marantaceae, investigating leaf tangles and litter in epiphytes. Found singly, in pairs or in small parties (probably families) of 3–7 individuals. Observed with other species at driver-ant columns, and often in company of ribboned rope squirrel (*Funisciurus lemniscatus*).

**Breeding.** Oct–Feb in Sierra Leone, Jun–Jan in Liberia, Dec–May in Ghana, Dec–May and Jul–Aug in Cameroon, Jun–Mar (mainly Dec–Feb) in Gabon, almost all year in DRCongo, Mar in Sudan and Nov–Mar in Kenya and Tanzania; breeding-condition birds in Jan–Feb and immature in Jan in Uganda. Territorial. Possibly co-operative breeder: groups appear to defend areas against other groups. Nest of two different types, one a large loose deep cup resembling a leaf tangle, lined with rootlets, dead leaves and *Marasmius* fungal strands, placed 0.8–2.5 m up in leafiest part of isolated forest bush, the other a rudimentary flat cup made of rootlets, twigs and dry leaves with an outer layer of moss. Clutch 2 eggs, bright blue-green (in Gabon) to beige (in DRCongo) or greyish-white (E Tanzania), all with small reddish-brown or blackish-brown spots; incubation by female only, period 14 days; chicks fed by both adults and one or two immatures, nestling period 10 days; young provisioned by both parents and one or two immatures. Brood parasitism at one nest attributed to Olive Long-tailed Cuckoo (*Cercococcyx olivinus*).

**Movements.** Resident. Four ringed individuals recaptured at ringing sites 2, 7 and 14 months later; two individuals recaptured together at same site 12 months later.

**Status and Conservation.** Not globally threatened. Fairly common in Sierra Leone and SE Guinea. Although described as uncommon at Mt Nimba and in Yapo Forest, in Liberia, now regarded as common but overlooked from coast to N mountains. Common in Tai Forest National Park, in Ivory Coast; fairly common in Ghana, where present in Kakum National Park; fairly common in forest zone in Nigeria. One of commonest birds in Korup National Park, in Cameroon, and present in Lobeke Reserve; common in Gabon, where density reaches 12 pairs/km<sup>2</sup>, and present in Dzanga-Ndoki National Park, in Central African Republic; in PR Congo, common in Odzala and Nouabalé-Ndoki National Parks (last-mentioned forms continuous block with Dzanga-Ndoki and Lobeke). Rare in extreme S of Sudan. Present in various E African parks and reserves, including Kakamega (Kenya); in Tanzania, Pugu Hills population long thought to be close to extinction, while Udzungwa National Park holds up to 18 pairs/km<sup>2</sup>.

**Bibliography.** Bannerman (1951, 1953), Bannerman *et al.* (1986), Borrow & Demey (2001), Britton (1980), Brosset & Énard (1974, 1986), Carswell *et al.* (2005), Cave & Macdonald (1955), Chapin (1953), Colston & Curry-Lindahl (1986), David & Gosselin (2002b), Dean (2000), Dickerman *et al.* (1994), Dowsett-Lemaire & Dowsett (2000), Eisenraut (1973), Elgood *et al.* (1994), Field (1974), Fry *et al.* (2000), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Jensen & Brøgger-Jensen (1992), Lewis & Pomeroy (1989), Mann (1985), Mlingwa *et al.* (1993), Moreau & Moreau (1937), Moyer (1993), Rand *et al.* (1959), Rodewald *et al.* (1994), Sclater & Moreau (1932), Serle (1950a, 1950b, 1954, 1957), Stevenson & Fanshawe (2002), Stuart (1986), Stuart & Hutton (1977), Stuart & van der Willigen (1978), van der Willigen & Lovett (1981), Zimmerman *et al.* (1996).

## 111. Brown Illadopsis

### *Illadopsis fulvescens*

**French:** Akalat brun **German:** Braunbauch-Buschdrossling **Spanish:** Tordina Parda  
**Other common names:** Brown Thrush-babbler, Brown-breasted Illadopsis; Moloney's Illadopsis (*moloneyana*, *iboensis*)

**Taxonomy.** *Turdiostris fulvescens* Cassin, 1859, Cama River, Gabon.

Has been placed in genus *Trichostoma* and in *Malacocincla*. Races *iboensis* and *moloneyana* have been thought possibly to represent a separate species; latter, however, appears to intergrade with race *gularis* in Ghana. Six subspecies recognized.

#### **Subspecies and Distribution.**

*I. f. gularis* Sharpe, 1870 – SW Senegal, Guinea-Bissau and Sierra Leone E to SW Ghana.

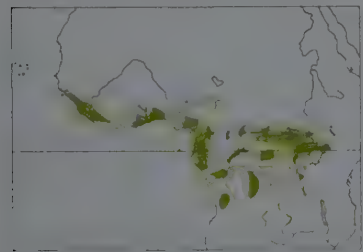
*I. f. moloneyana* (Sharpe, 1892) – SE Ghana E to SW Nigeria.

*I. f. iboensis* (E. J. O. Hartert, 1907) – SE Nigeria and SW Cameroon; also (probably this race) in C Nigeria (Jos Plateau).

*I. f. fulvescens* (Cassin, 1859) – S Cameroon S to S PR Congo, extreme W DRCongo, also W Central African Republic.

*I. f. ugandae* (van Someren, 1915) – SC Central African Republic and E PR Congo E through DRCongo to S Sudan, Uganda, W Kenya and W Tanzania, also NE Angola.

*I. f. dilutor* (C. M. N. White, 1953) – NW Angola.



crown, more rufescent above and below, than adult. Race *gularis* has head browner than nominate, little throat streaking, is more olive-brown below; *iboensis* is like previous above, chin to breast rufescent ochre with no streaking; *moloneyana* is rufous-brown above, rufescent brown below, with chin to breast rufescent ochre, legs blackish; *ugandae* is paler below than *gularis*, with throat purer white and virtually unstreaked (those from Bwamba, in W Uganda, considerably darker on crown, more olive on mantle, more olive-buff on breast and flanks, with more defined grey-tinged throat patch); *dilutor* is like last, but throat faintly streaked, breast brighter buff. Voice. Song,

usually a duet or trio, a slow, deliberate, simple pair of melancholy whistles (each variable in tone and pitch), a short upslurring “wheééé” or “tyop” and longer-drawn, ringing “whúúúú” or “waaah”, e.g. “tyop... waaah... tip... woou... tyop... waaah”, sometimes in 3-note version, lasting several seconds with intervals of 2–3 seconds; in Kenya and Gabon, singer accompanied by two or more others giving nasal “jip jip jappaaaangh” (“dict-a-phone” song), and in W Africa accompanists give rapid “gih-gih-ger-ger-ger...” chatter; in E Africa male described as having rhythmic descending “prrrrrp wiwi wiwi... wiyu”. Flock-members give little chattering, rolling and grating calls, “chip”, “chippa” “chrrr”, “chu-chu” and/or “jthree-jajajaja”; at driver-ant columns a short “chiii” and “cheu”; alarm calls include nasal “chwaa” and high, squeaky “weet weet weet” and “ek” notes.

**Habitat.** Dense undergrowth in clearings, thickets along roads, treefall light-gaps and vine tangles in primary forest and old secondary forest, transition forest, shrub-forest mosaic, farmbush, thick bush bordering forest, also sometimes tangled streamside vegetation in savanna country, gallery forest, coffee and tree plantations and logged forest, even in pure stands of arrowroot (Marantaceae). Evidently favours naturally disturbed patches, such as storm-damaged plots and streamside tangles where vegetation dense and complex cover extends laterally and vertically. In Upper Guinea forest commoner in logged and disturbed areas, whereas in Lower Guinea a species of primary forest. Apparently larger-billed and longer-tailed than its congeners, and adapted more for life in bushes. Generally lowlands to 1400 m, but to 1525 m in Sudan and Kenya, 1550 m in DRCongo and 1800 m in Uganda.

**Food and Feeding.** Mainly invertebrates, including small beetles (Coleoptera), bugs (Hemiptera), orthopterans (small grasshoppers, bush-crickets), termites (Isoptera), ants (Formicidae), moths and caterpillars (Lepidoptera), insect eggs, spiders (Araneae), centipedes (Chilopoda) up to 7 cm long, millipedes (Diplopoda) and small molluscs; also, a few hard brown seeds. Forages by pecking and probing, rather than sallying, habitually working its way up a liana tangle to c. 8 m, then flying down to next tangle, searching in leaf clusters, peering in dense debris, investigating dead wood, probing interlaced stems and dead leaves; commonly clings to vertical stems near ground. Occurs in pairs, in family groups or in small parties of 4–6 or so individuals, sometimes in association with other species in bird waves. When foraging with *I. rufipennis*, keeps higher in storey, at 10–16 m, and in dry season will move up into vine tangles in canopy; otherwise tends to stay in zone from on or near forest floor (0.5 m) to 18 m, mainly 4–12 m. Sometimes feeds in association with driver-ant columns, and often in company of ribboned rope squirrel (*Funisciurus lemniscatus*).

**Breeding.** Oct–Jun in Sierra Leone, Jun–Jan in Liberia, and juveniles in Oct and Dec in Ivory Coast; juveniles in Aug and breeding-condition bird in Oct in Nigeria; Sept–Nov, Feb–May and Jul in Cameroon, and Jul–Oct and Dec–Mar in Gabon; all year (or almost so) in DRCongo; Jun and Oct in Central African Republic; Aug in Sudan; nest with eggs in Jul, breeding-condition birds in Feb–May and Nov, and birds with brood patches in Oct and Dec in Uganda; Jun–Jul in Tanzania; breeding-condition bird in Sept in Angola. Territorial. Apparently in small groups consisting of mated pair and offspring from previous breeding season. Nest, constructed by both sexes, a large, loose, untidy shallow cup, sometimes with half-canopy, made of dead or decaying leaves, leaf skeletons, dead pieces of fern and fine stems, lined with tendrils, fine stems, rootlets, *Marasmius* strands and/or petioles, placed on ground, in sapling, low bush, small tree-fern or tangle of lianas, 0.5–2 m (exceptionally 3.5 m) above ground; may appear to be almost decaying from damp. Clutch 2 eggs, variably white, cream or pinkish-white, densely mottled maroon or reddish-brown. Sometimes with purplish-grey or pinkish-grey undermarkings (in Sierra Leone said to be pale greenish-blue, speckled brown or with heavy sepia blotches and smudges); incubation by only one member of pair (probably female), period at least 12 days; nestling period 14 days at one nest. Brood parasitism by *Chrysococcyx* cuckoos occurs. Of 12 nests in one study, 8 destroyed by predators and 4 fledged only four young.

#### **Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common across range; numbers increase in logged forest (Liberia). Reports of this species' occurrence (race *gularis*) in Mali now considered erroneous. Regular in Basse-Casamance region of Senegal, so presumably in national park of that name. Common in Guinea, Sierra Leone and Liberia (where commonest illadopsis on Mt Nimba and Mt Wuteve at 1200–1400 m), and common in Yapo Forest, in Ivory Coast. Fairly common in the forest zone in Ghana, and more so in coastal thickets; fairly common in S Togo. Present in Korup National Park and Lobeke Reserve, in Cameroon; common to abundant at Mhini, in Gabon, where density reaches 10–12 pairs/km<sup>2</sup>; widespread and common in PR Congo from coast N to Brazzaville, and in Odzala and Nouabalé-Ndoki National Parks; in Central African Republic present in Dzanga-Ndoki National Park (this, Nouabalé-Ndoki and Lobeke forming continuous block). Commonest illadopsis in Congo Basin. Most widespread illadopsis in Uganda, and common in forests there. Rare in extreme S Sudan.

**Bibliography.** Allport *et al.* (1996), Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1980), Brosset & Énard (1974, 1986), Carswell *et al.* (2005), Cave & Macdonald (1955), Chapin (1953), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), David & Gosselin (2002a, 2002b), Dean (2000), Dowsett-Lemaire (1997a), Dowsett-Lemaire & Dowsett (2000, 2005), Eisenraut (1973), Elgood *et al.* (1994), Fry *et al.* (2000), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Lewis & Pomeroy (1989), Louette (1981), Morel & Morel (1990), Ngabo & Dranzoo (2001), Nikolaus (2001), Rand *et al.* (1959), Rodewald *et al.* (1994), Serle (1950a, 1950b, 1957, 1965), van Someren & van Someren (1949), Stevenson & Fanshawe (2002), Stuart (1986), Willis (1983), Zimmerman *et al.* (1996).

## 112. Mountain Illadopsis

### *Illadopsis pyrrhoptera*

**French:** Akalat montagnard **German:** Berghbuschdrossling **Spanish:** Tordina Montañesa  
**Other common names:** Mountain Thrush-babbler

**Taxonomy.** *Callene pyrrhoptera* Reichenow and Neumann, 1895, Mau (0°10' S, 35°41' E), Kenya. Previously placed in genus *Malacocincla*. Has been thought to form a superspecies with *I. rufipennis*, normally occurring at higher altitudes than latter in areas of sympatry. Two subspecies recognized.

#### **Subspecies and Distribution.**

*I. p. pyrrhoptera* (Reichenow & Neumann, 1895) – E DRCongo, SW & F Uganda, W Kenya, Rwanda, Burundi and W Tanzania.

*I. p. nyasae* (Benson, 1939) – N Malawi.

**Descriptive notes.** 13–14.5 cm; 20–30 g. Nominat race has olivaceous-grey crown with indistinct darker scaling, grey lores, cheek and neck side, narrow indistinct supercilium pale grey; upperparts dark rufous-tinged olive-brown, tail rufous-tinged brown; chin and throat greyish-white, shading to grey on breast and paler again on belly, latter tinged brown, flanks and undertail-coverts rich brown, thighs grey; iris hazel to reddish-brown, pale eyering; upper mandible greyish-black, lower mandible paler grey; legs brownish-grey to slate-grey. Sexes similar. Juvenile has whole upperside, including head, more rufescent-brown, crown like back. Race *nyasae* has top of head brown, breast paler grey than nominate. Voice. Song a duet, a simple melodious warble in which presumed male gives usually 3 well-spaced pure whistles on descending scale with interspersed brief chatter notes,





"whee... tata-whaaa... whoah" and "whee... tatata-whaaa... ta-whoah", while second bird (or several others) maintains unsynchronized chattering accompaniment, "chut-chut", "chipchipchip" and "prrrrr" (Uganda); song variable, perhaps geographically, but basic structure similar throughout range; also described as "trtrtrtr...ti-ti tiu tiyu", like that of *I. fulvescens* but higher and more rambling. Contact calls include continual low twittering "chek-chek" notes when on the move, and rolled, nasal "prreet".

**Habitat.** Bamboo and dense leafy undergrowth of primary and secondary montane and transi-

tion evergreen forest, gallery forest, impenetrable thickets 2–4 m high on slopes (e.g. with *Alchornea* and *Dracaena*) and along streams (e.g. with *Anisotes* and *Mimulopsis*); at 1550–2800 m in Kenya and Uganda, 1600–2300 m in Malawi.

**Food and Feeding.** Invertebrates, including ants (Formicidae), small crickets (Orthoptera), moths and caterpillars (Lepidoptera), and small snails; also berries and seeds. Forages in deep shade on forest floor and to 4 m up in vegetation, mostly below 1.5 m; turns over litter, probes leaf clusters,

hops through tangled fallen branches. Found in pairs and in small parties of 3–6 individuals; joins bird waves, and attends army-ant swarms.

**Breeding.** Jan–Feb and Jul–Aug, also breeding-condition bird and immature in May and bird with brood patch in Sept, in Uganda; breeding-condition bird in Mar in Kenya; Jun–Jul in DR Congo; oviduct eggs in Feb in Rwanda; breeds Sept in Malawi. Only one nest found, a substantial, rather sturdy cup of green moss, dry leaves, dry herb leaves and stems, thinly lined with dry rootlets and moss, 1.4 m above ground and extremely well hidden, as embedded 5 cm into dead dry leaves on thick bed of damp decaying leaves on rock ledge, overhung by fern leaves and dead tree leaves. Clutch 2 eggs, very pale blue-green with brown and purplish-brown splashes. No other information.

**Movements.** Resident; in W Kenya, irregular and rare occurrence in Kakamega Forest speculated as involving wanderers from higher areas (e.g. Nandi).

**Status and Conservation.** Not globally threatened. Generally uncommon to very common in different parts of range. Very common in W Rwanda. Often common in Uganda, and commonest at higher altitudes. Patchily common in N Malawi, where common in Uzumara Forest Reserve and fairly local in Nyika National Park, also in Chimaliro Army Range.

**Bibliography.** Benson (1953), Benson & Benson (1977), Britton (1980), Butynski & Kalina (1989), Carswell *et al.* (2005), Chapin (1953), David & Gosselin (2002b), Dowsett-Lemaire (1989, 1990, 2006), Dowsett-Lemaire & Dowsett (1983, 2006), Fry *et al.* (2000), Gaugris *et al.* (1981), Hall & Moreau (1970), Jackson & Sclater (1938), Lewis & Pomeroy (1989), Mann (1985), Prigogine (1971), van Someren & van Someren (1949), Stevenson & Fanshawe (2002), Zimmerman (1972), Zimmerman *et al.* (1996).







# Genus *PELLORNEUM* Swainson, 1832

## 113. Buff-breasted Babbler

### *Pellorneum tickelli*

**French:** Akalat de Tickell **German:** Rostbrust-Erdtimalie **Spanish:** Tordina de Tickell  
**Other common names:** Tickell's Babbler, Buff-breasted Jungle Babbler, Mountain Brown Babbler

**Taxonomy.** *Pellornium* [sic] *Tickelli* Blyth, 1859, "Woods of Teewap'hado", 1100 to 1500 feet [c. 35–460 m], Amherst District, Tenasserim, Myanmar. Formerly placed in genus *Trichostoma*. Has been thought possibly to form a superspecies with *P. pyrogenys*, presumably including *P. buettikoferi*. Previously considered conspecific with latter. Proposed race *garoense* (from Meghalaya and Manipur, and adjacent areas in NE India) may be worthy of recognition. Five subspecies currently recognized.

#### Subspecies and Distribution.

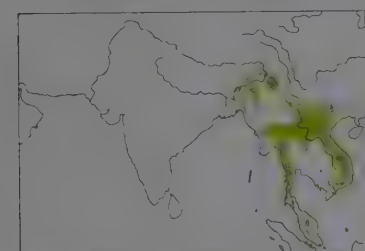
*P. t. assamense* (Sharpe, 1883) – NE India (Arunachal Pradesh, E & S Assam, Meghalaya, Manipur), E Bangladesh and N & W Myanmar.

*P. t. griseus* (Ticehurst, 1932) – SW Myanmar (W of R Irrawaddy).

*P. t. fulvum* (Walden, 1875) – S China (SW to SE Yunnan, W Guangxi), SE Myanmar, NW & N Thailand, N & C Laos and N Vietnam (Tonkin, N Annam).

*P. t. annamense* (Delacour, 1926) – N & E Cambodia, S Laos and C & S Vietnam (C & S Annam, Cochinchina).

*P. t. tickelli* Blyth, 1859 – S Myanmar (Tenasserim), W & S Thailand and Peninsular Malaysia.



dark horn-brown, lower mandible flesh-coloured; legs brownish-grey to yellowish-flesh. Sexes similar. Juvenile has strongly rufescent upperparts. Race *assamense* is darker above (darkest race), with darker ochre-buff underparts including some brownish feathering on breast side and flanks; *griseus* is paler and greyer above, much paler (cream-buff) below and on flanks; *fulvum* is slightly darker and colder above and on flanks; *annamense* is slightly warmer above, warmer buff below, with no white on belly. **Voice.** Song a loud, sharp, quickly repeated "wi-tee" or "wi-choo", sometimes incessantly repeated, without pause, e.g. "witweewitweewitwee..." or "witutitwitutitwitutit..."; also a high-pitched jolly laughing "swi-tit-tit-titchoo" and variants. Song in Indian Subcontinent transcribed as a loud, sweet, monotonous series of whistled, slightly slurred, upturned opposing couplets, "teet-sweéet, teet-sweéet..." Calls include harsh rattling "prree" or "trrit" notes, interspersed with higher "pieu" or explosive "whit" or "twit" notes, thus sometimes a sweet, sharply falling "(whit)-tseeuu".

**Habitat.** Evergreen forest and occasionally mixed deciduous open or deep forest, secondary growth, bamboo thickets, heavy cut-over scrub, undergrowth of edges of primary, logged and secondary forest. To 1550 m; above 610 m in Peninsular Malaysia.

**Food and Feeding.** Insects, including beetles (Coleoptera), and spiders (Araneae). Found in pairs; sometimes associates with other small babblers. Skulks in dense undergrowth; keeps close to ground.

**Breeding.** Mar–Jul generally; multi-brooded. Nest a domed, semi-domed or deep cup, made of dry bamboo or other leaves, fine grasses and thin blackish rootlets, scantily or neatly lined with fine grasses and roots, placed on ground, sometimes at base of sapling, or up to 1.5 m (usually less than 0.3 m) above ground in low bush or bamboo clump. Clutch 3–4 eggs, white to pale olive-grey, densely covered with dots, freckles and small blotches of reddish-brown to olive-brown, sometimes with underlying lavender and purplish-grey markings. No other information.

#### Movements.

Resident.

**Status and Conservation.** Not globally threatened. Locally common in India, where present in Namdapha National Park (Arunachal Pradesh). Locally common in Bangladesh. Common in limited range in China; recently recorded in Diding Nature Reserve (SW Guangxi), but at best uncommon there. Generally common in SE Asian range. Present in many protected areas in Thailand. Present (and often common) in Xe Pian National Biodiversity Conservation Area (NBCA) and in Hin Namno, Phou Dendin, Phou Khaokhoay, Phou Xang He, Xe Bang Nouan, Nakai-Nam Theun, Phou Xiang Thong and Dong Hua Sao NBCAs, in Laos. In Vietnam, common in Cuc Phuong National Park, and present in Na Hang, Thuong Da Nhim and Chu Yang Sin Nature Reserves, and in eleven protected areas in the Annamese lowlands.

**Bibliography.** Ali & Ripley (1948, 1971), Bangs (1921), Bingham (1903), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paulai (1960, 1962), Choudhury (2003), Cox *et al.* (1992), David-Beaulieu (1939, 1944, 1950), Davidson (1998), Davidson *et al.* (1997), Deignan (1963), Delacour & Jabouille (1931a), Delacour *et al.* (1928), Duckworth (1998), Eames (1995), Eames *et al.* (2001), Engelbach (1932), Evans & Timmins (1998), Evans *et al.* (2000), Grimmett *et al.* (1998), Gyldenstolpe (1916), Hill (2000), Hopwood & Mackenzie (1917), Hume & Oates (1889), King & Han Lianxian (1991), Kinnear (1929), La Touche (1923), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lekagul & Round (1991), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Nguyễn Duc Tuat *et al.* (2001), Oates (1883), Rasmussen & Andersen (2005), Robbins *et al.* (2006), Robinson (1928), Robinson & Kloss (1919a), Robinson (2000), Round (1999), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khankhoun Khounholine (1998), Singh (1995), Smith *et al.* (1941), Smythes (1886), Stanfara (1935), Stanford & Ticehurst (1930), Ticehurst *et al.* (1996), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Waiston *et al.* (2001).

## 114. Sumatran Babbler

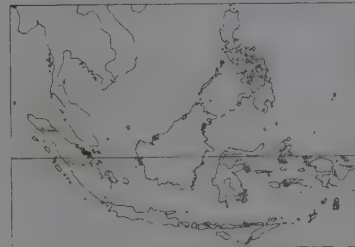
### *Pellorneum buettikoferi*

**French:** Akalat de Sumatra **German:** Sumatra-Erdtimalie **Spanish:** Tordina de Sumatra  
**Other common names:** Büttikofer's Babbler

**Taxonomy.** *Trichostoma buettikoferi* Vorderman, 1892, Lampung district, southern Sumatra. Previously treated as conspecific with *P. tickelli*; presumably part of possible superspecies formed by latter and *P. pyrogenys*. Monotypic.

#### Distribution.

Sumatra.



**Descriptive notes.** 15 cm. A nondescript babbler with disproportionately short tail, pale grey face. Crown, upperparts and side of neck olive-brown, tinged dull grey on crown and nape, with slight rufous tinge on upperwing and tail, pale feather shafts on crown forming narrow but fairly conspicuous streaking; lores, eyering and cheek pale buff with some olive-grey mottling or fine scaling, not sharply set-off from ear-coverts and stripe above eye, which are olive-grey with narrow pale shaft streaks; underparts, including underwing-coverts, isabelline-buff, grading to pale cream or off-white on throat and on mid-belly, and into

darker greyish-ochre on lower flanks and on outer thigh; upper breast marked with faint grey triangular marks; iris pale amber or red to pale brown; upper mandible grey, cutting edges and lower mandible horn-flesh; legs pale horn-flesh, sometimes pale yellow. Differs from very similar *P. tickelli* in paler plumage, shorter tail. Sexes similar. Juvenile is close to adult in colour, differing mainly in looser-webbed plumage, especially on belly to undertail-coverts; grey marks on breast vestigial or absent, lower flanks and undertail-coverts paler greyish-isabelline, mid-belly purer and more extensively white. **Voice.** Song a rather loud "pwiyu pii biyo" and "pii byo pwiyu", resembling that of *Trichostoma rostratum* but repeated more quickly and consisting of 3 whistles.

**Habitat.** Undergrowth in and edges of primary, lightly logged and heavily logged broadleaf evergreen forest, from coastal forest into hill forest to 900 m.

**Food and Feeding.** Insects, including beetles (Coleoptera) and caterpillars. Forages on ground; skulks in undergrowth.

**Breeding.** Mar–Jun, with dependent young in Aug and Dec. Clutch 2 eggs; young fed by both sexes. No other information.

#### Movements.

Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Conversion of lowland forest to oil-palm and other plantations extensive, especially since 1980s. Present in Gunung Leuser and Bukit Tigapuluh National Parks, in small numbers in latter.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Slatersfield (2004), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Holmes (1996), Kloss (1931), MacKinnon (1988), MacKinnon & Phillips (1993), van Marle & Voous (1988), Meyer de Schauensee & Ripley (1940a), Ripley & Beeher (1985), Robinson & Kloss (1919b, 1920, 1924b), Stone (1903), Wells *et al.* (2001).

## 115. Temminck's Babbler

### *Pellorneum pyrogenys*

**French:** Akalat de Temminck **German:** Rostwangen-Erdtimalie **Spanish:** Tordina de Temminck

**Taxonomy.** *Myiothera pyrogenys* Temminck, 1827, Bantam Province, Java.

Has been thought possibly to form a superspecies with *P. tickelli*, presumably including *P. buettikoferi*. Proposed race *besuki* (from E Java) considered inseparable from nominate. Individuals of this species observed in N & S Borneo (E Sabah and S Kalimantan) apparently not assigned to race. Four subspecies recognized.

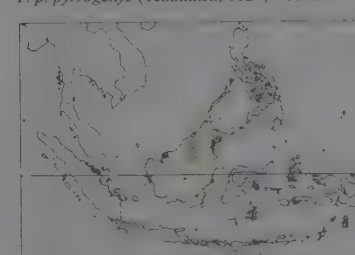
#### Subspecies and Distribution.

*P. p. canicapillus* (Sharpe, 1887) – N Borneo (W Sabah).

*P. p. longstaffi* (Harrison & Hartley, 1934) – NW Borneo (E & NE Sarawak and adjacent Kalimantan).

*P. p. erythrota* (Sharpe, 1883) – W Borneo (SW Sarawak and adjacent Kalimantan).

*P. p. pyrogenys* (Temminck, 1827) – Java.



**Descriptive notes.** 15 cm. Smallish babbler, dull brown above with darker cap, whitish below with rufescent breastband. Nominat race has crown greyish-brown with pale shaft streaks, upperparts rufous-brown, becoming slightly more chestnut on upperwing and tail, especially at base of latter; lores, cheek and ear-coverts rufescent brown with pale shaft streaks, submoustachial area to breast side and breast bright fulvous, chin and throat, belly and vent white (amount of rufescent brown apparently variable, may extend to flanks and vent); iris red-brown; bill black, lower mandible paler; legs brownish-flesh to lead-grey. Sexes

similar. Juvenile apparently undescribed. Race *erythrota* has upperparts paler than nominate, face side more rufous, breastband more distinct; *longstaffi* is larger, with blackish cap, deeper rufescent flanks and vent; *canicapillus* is like previous but smaller, breastband less extensive, cap blackish-grey. **Voice.** Song a quickly repeated, loud, rather shrill "witichew", with varying pauses between phrases; sometimes almost continuous, as e.g. "witichew witichew witichew", occasionally just "chew". Also has jolly, skipping ditty with slurred end-note, "tip'ip'ip'ip'ip-zrii".

On following pages: 116. Black-capped Babbler (*Pellorneum cupistratum*); 117. Puff-throated Babbler (*Pellorneum ruficeps*); 118. Brown-capped Babbler (*Pellorneum fuscicapillus*); 119. Marsh Babbler (*Pellorneum palustre*); 120. Spot-throated Babbler (*Pellorneum albiventris*); 121. Moustached Babbler (*Malacopteron mugnirostre*); 122. Sooty-capped Babbler (*Malacopteron affine*); 123. Sealy-crowned Babbler (*Malacopteron cinereum*); 124. Rufous-crowned Babbler (*Malacopteron magnum*); 125. Melodious Babbler (*Malacopteron palawanense*); 126. Grey-breasted Babbler (*Ophrydornis albobularis*); 127. Abbott's Babbler (*Malacocincla abbotti*); 128. Horsfield's Babbler (*Malacocincla sepiaria*); 129. Black-browed Babbler (*Malacocincla perspicillata*); 130. Short-tailed Babbler (*Malacocincla malaccensis*); 131. Ashy-crowned Babbler (*Malacocincla cinereiceps*).



**Habitat.** Undergrowth of primary forest, and dense vegetation at edges of clearings; lowlands to 1300 m in Java, 490–1550 m in Borneo, where considered a species of lower montane forest.

**Food and Feeding.** Ants (Formicidae) and large insects. Forages on ground, hopping (not walking), or keeps mainly to undergrowth below 3 m, sometimes working up vine-covered trees, picking items from plant stems near ground and undersides of leaves.

**Breeding.** Dec–Apr in Borneo. Nest a compact cup built in base of shrub, tussock or aerial root. Clutch 2 eggs, dull bluish-green, usually fairly thickly spotted with brown and purplish-grey or reddish. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common in Borneo; judged uncommon in Sabah, but fairly common in Mount Kinabalu National Park; present in Kayan Mentarang National Park, in E Kalimantan, and Gunung Niut Nature Reserve, in W Kalimantan. Present in Ujung Kulon National Park and scarce in Gunung Halimun National Park, in W Java, and in Alas Purwo National Park, in E Java.

**Bibliography.** David & Gussel (2003a), Davison (1997a), Grimham (2000), Holmes (1997), Hoogerwerf (1971), Kloss (1931), MacKinnon (1988), MacKinnon & Philipps (1993), Priem & Heegaard (1988), Ripley & Beeher (1985), Sheldon *et al.* (2001), Smythies & Davison (1999), Sody (1956), Thompson (1966), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 116. Black-capped Babbler

### *Pellorneum capistratum*

French: Akalat à calotte noire

Spanish: Tordina Coroninegra

German: Schwarzkappen-Erdtimalie

**Taxonomy.** *Myiothera capistrata* Temminck, 1823, Java.

Nominate race relatively distinct from others, and possibly a separate species; further study, including of vocalizations, required. Proposed race *nyctilampis* (from S Sumatra and Bangka) synonymized with *nigrocapitatum*. Four subspecies recognized.

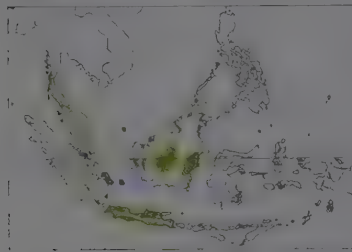
**Subspecies and Distribution.**

*P. c. nigrocapitatum* (Eyton, 1839) – extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, Sumatra, Bangka, Belitung and N Natuna Is.

*P. c. morrelli* Chasen & Kloss, 1929 – N Borneo (Sabah) and Banggi I.

*P. c. capistratoides* (Strickland, 1849) – W, C & S Borneo.

*P. c. capistratum* (Temminck, 1823) – Java.



**Descriptive notes.** 16–17 cm; 24–35 g. Brown-and-rufous babbler with striking head pattern. Nominate race has crown and nape black, supercilium from above lores to behind eye deep orange-rufous, becoming buffy white at rear, with grey eyestripe behind eye; lores pale buffy grey, ear-coverts pale orange-tinged buff with vague dark streaks; upperparts and underparts warm mid-brown, with vague olive cast on mantle, uppertail-coverts, tail and wing fringes tinged rufous; chin and centre of throat whitish, throat side and underparts rich rufous-tan or orange-rufous, flanks and undertail-coverts slightly darker or with some grey; iris brown to red; upper mandible black, lower mandible whitish to pale slate; legs pale brown or purplish-brown to dark blue-grey. Sexes similar. Juvenile has browner crown than adult, with orange-rufous also on throat. Race *nigrocapitatum* has supercilium and ear-coverts mid-grey with whitish shafts, rear ear-coverts mixed with orange-brown, well-marked blackish moustachial stripe, dark chestnut-brown upperparts, throat whitish, underparts deeper in tone than nominate, flanks and vent mixed with colour of upperparts; *morrelli* is like previous, but supercilium whitish with faint pale grey borders of feathers, ear-coverts overall darker grey, a little blacker on lores, faint narrow dark grey malar line, upperparts more chestnut; *capistratoides* resembles last, but with blacker ear-coverts, slightly darker upperparts and underparts. **VOICE.** Nominate race sings with loud, clear, full “ti-tuu” or “pi-tuu”, every 2–4 seconds, recalling second 2 notes of alternative song by race *morrelli*. Typical song of *morrelli* a thin, clear, mournful “ti-i-uu” or “ti-i-uu” repeated every few seconds (occasionally with simpler, flatter “tchu-i”), thus using 3 syllables; another song type in duet recalls that of *P. ruficeps*, presumed male uttering loud clear full “huu-ti-tuu” or “tuu-ti-tuu” (shorter gap between middle and last notes) every 5–10 seconds, presumed female giving whining nasal “weep-weep-weep-weep”. Race *nigrocapitatum* sings with loud, high-pitched “téeu”, repeated every few seconds. Calls include subdued “hekehkekheke...” and “yeryeryer...” and high nasal “nwit-nwit-nwit...”, also reported as liquid rising “pooee!”.

**Habitat.** Floor and understorey of primary broadleaved evergreen forest, logged and secondary forest, upland kerangas, peatswamp, bamboo and palm thickets, cane brakes, overgrown rubber, *Albizia*, cocoa, and sandy-soil scrub and forest adjacent to beaches and mangroves; to 760 m in SE Asia, but reaches 1300 m in Java and 1400 m in Borneo.

**Food and Feeding.** Insects, including orthopterans (grasshoppers, locusts), ants (Formicidae), termites (Isoptera), caterpillars and grubs; also spiders (Araneae), worms and snails. Found singly or in pairs. Forages on ground, usually with walking gait; runs along through leaf litter, takes short flights. Makes only short forays into undergrowth 0.5 m above ground.

**Breeding.** Apr–Jun in SE Asia, Feb–Apr and Aug–Dec in Java, and May–Jun in Kalimantan (Borneo). Nest described as an outwardly untidy cup, made of dead leaves, twigs, and coarse fern roots, lined with rootlets, fine fibres and fine dry grasses, placed on ground, sometimes in depression, sheltered by leaves, sapling or clump of ferns, or up to 0.6 m above ground in spiny palm or bush. Clutch 2 eggs, whitish or creamy, freckled with pale purplish-brown or maroon, with underlying pale pinky-purple to maroon spots and clouds. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common in continental part of range, and common in N Borneo (Sabah). Numbers decline in response to fragmentation of lowland-forest habitat. Common in Khao Pra-Bang Kham Wildlife Sanctuary, in Thailand, and Taman Negara National Park, in Peninsular Malaysia. In Borneo, common in Danum Valley Conservation Area (Sabah), present in Similajau National Park (Sarawak), and common in Tanjung Puting National Park (S Kalimantan). Present in Gunung Leuser National Park and scarce in Way Kambas National Park, in Sumatra. Present in Ujung Kulon National Park, in W Java, and uncommon in Alas Purwo National Park, in E Java.

**Bibliography.** Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Deignan (1962), Duckworth *et al.* (1997), Grimham (2000), Hoogerwerf (1971), Hume & Davidson (1878), Jullien & Oates (1889), bin Jatan & Galdikas (1987), Johns (1989), Lambert & Collier (2002), Lekagui & Round (1991),

Löffing (2004), MacKinnon (1988), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Nash & Nash (1988), Oates (1883), O’Brien & Kinnaird (1996), Parrott & Andrew (1996), Robinson (1928), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Sody (1956), Thompson (1966), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 117. Puff-throated Babbler

### *Pellorneum ruficeps*

French: Akalat à poitrine tachetée

Spanish: Tordina Pechiestriada

German: Streifenbrust-Erdtimalie

Other common names: Spotted/Striped Babbler

**Taxonomy.** *Pellorneum ruficeps* Swainson, 1832, Coonoor, Tamil Nadu, India.

Race present in N Myanmar uncertain, presumed to be *pectoralis*; similarly, in Cambodia, race in NE presumably *ubonense*, in E *deignani*, and in SE *dilloni*. Despite high number of named races, several more may exist, e.g. in Myanmar (Arakan, and in Sittang valley), in NC plains of Thailand, and in Peninsular Malaysia (Langkawi I). Twenty-eight subspecies recognized.

**Subspecies and Distribution.**

*P. r. punctatum* (Gould, 1838) – SW Jammu and Kashmir E to Uttaranchal Pradesh, in N India.

*P. r. mandellii* Blanford, 1871 – Nepal E to NE India (C Arunachal Pradesh).

*P. r. ruficeps* Swainson, 1832 – peninsular India except S.

*P. r. olivaceum* Jerdon, 1839 – SW India.

*P. r. pallidum* Abdulali, 1982 – SE India.

*P. r. chamelum* Deignan, 1947 – NE Indian states S of R Brahmaputra (except Manipur) and E Bangladesh.

*P. r. pectorale* Godwin-Austen, 1877 – NE India (E Arunachal Pradesh) and extreme N Myanmar.

*P. r. ripleyi* Deignan, 1947 – Margherita area of E Assam (NE India).

*P. r. vocale* Deignan, 1951 – Manipur Valley (NE India).

*P. r. stageri* Deignan, 1947 – S part of N Myanmar.

*P. r. hilarum* Deignan, 1947 – W (N Chin State) & C Myanmar.

*P. r. victoriae* Deignan, 1947 – C & S Chin State (W Myanmar).

*P. r. shanense* Deignan, 1947 – E Myanmar and S China (W & SW Yunnan).

*P. r. minus* Hume, 1873 – S Myanmar.

*P. r. subochraceum* Swinhoe, 1871 – SE Myanmar (including N Tenasserim) and adjacent W Thailand.

*P. r. insularum* Deignan, 1947 – extreme S Myanmar (S Tenasserim).

*P. r. indistinctum* Deignan, 1947 – extreme NW Thailand.

*P. r. chthonium* Deignan, 1947 – NW Thailand (except extreme N).

*P. r. elbeli* Deignan, 1956 – NE Thailand.

*P. r. dusiti* Dickinson & Chaiyaphun, 1970 – W slope of Dong Phrayayai range (W part of NE Thailand).

*P. r. acrum* Deignan, 1947 – W & S Thailand and N Peninsular Malaysia.

*P. r. oreum* Deignan, 1947 – S China (S Yunnan), N Laos and NW Vietnam (W Tonkin).

*P. r. vividum* La Touche, 1921 – SE Yunnan and N & C Vietnam (E Tonkin, N & C Annam).

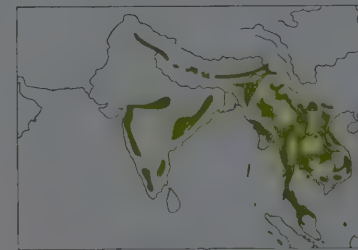
*P. r. ubonense* Deignan, 1947 – NE (E part) Thailand, S Laos and adjacent NE Cambodia.

*P. r. euroam* Deignan, 1947 – SE Thailand and Cambodia (except E).

*P. r. deignani* Delacour, 1951 – S Vietnam (S Annam) and adjacent E Cambodia.

*P. r. dilloni* Delacour, 1951 – S Vietnam (Cochinchina) and adjacent SE Cambodia.

*P. r. smithi* Riley, 1924 – coastal islands off SE Thailand.



**Descriptive notes.** 15–17 cm; 21–31 g. Smallish babbler, pale brown above and buffy white below, with distinctive head pattern and broad streaks on breast and flanks. Nominate race has dull rufescent crown, nape and upper mantle, indistinct buffy tips of forehead feathers, buffy-whitish supercilium from bill base over buff-brown ear-coverts; upperparts warm-tinged pale greyish-brown, upperwing and tail browner with greyish-brown fringes; chin to lower belly buffy whitish, breast with prominent, broad pale grey-brown streaks that become broader and more suffused on flanks, vent lightly tinged buff with broad pale grey-brown centres; iris orange-brown to deep crimson; upper mandible greyish-brown, lower mandible fleshy yellow; legs yellowish-flesh or brownish-flesh. Sexes similar. Juvenile is paler than adult, with less contrast between crown and back, underparts dull white, washed with dull ashy ochre on sides, no lanceolate spots, undertail-coverts dull ashy ochre. Race *olivaceum* is larger than nominate, upperparts darker, crown dull chestnut, dark tips on forehead, border of ear-coverts darker, streaks on underparts heavier, darker and more oval, generally whiter below; *pallidum* is strikingly paler above; *punctatum* has greyish cast to forehead, and a hindcollar of streaked pale-edged darker feathers, underparts buffier; *mandellii* is like previous but wing and wing-coverts as nominate, crown darker and more chestnut than nominate, hindcollar much more boldly patterned, buffier below; *chamelum* is similar to last but paler and greyer above, streaks on underparts a little broader; *pectoralis* also is similar, but crown and nape darker, breast streaks more numerous and forming sharply demarcated gorget, streaks below broader overall, underparts a little richer buff; *ripleyi* also is similar, but crown richer-toned, more rufescent upperparts, richer buff wash below; *vocale* is like *chamelum* below, but crown more chestnut, darker above; *stageri* is darker than nominate, crown deeper-toned, upperparts darker, hindcollar strongly patterned, streaks below broader and more numerous; *shanense* differs from last in paler and brighter crown, weaker hindcollar, paler and more olivaceous upperparts, weaker and fewer breast streaks; *hilarum* is like previous, but hindcollar even less obvious; *victoriae* is like last, but crown paler and greyer, underparts paler; *minus* is like nominate in having no hindcollar pattern, but has brighter rufous crown than any of preceding races, with rufescent-tinged olive-brown upperparts, buff-washed underparts, sparse narrow breast streaks; *subochraceum* is like previous, but paler and more rufescent above, brighter buff below; *insularum* is similar to last, but darker and richer above and richer buff below, also warmer on ear-coverts and neck side; *acrum* also is similar, but darker and colder above, with deeper-toned crown, paler below; *chthonium* is like last above, but with weak hindcollar pattern, broader and more coarse breast streaks, whiter ventrally; *indistinctum* is similar to previous, but crown and upperparts vaguely paler, latter more rufescent, underparts slightly buffier; *elbeli* is darker above and more strongly streaked below than last; *dusiti* is like previous but much whiter below, with darker, narrower and more contrasting breast streaks; *oreum* is rather deep-toned above, has fairly well-defined hindcollar, weak buff wash below, fairly strong breast streaking; *vividum* is

like previous, but crown and upperparts vaguely paler, latter more rufescent, underparts slightly buffier; *elbeli* is darker above and more strongly streaked below than last; *dusiti* is like previous but much whiter below, with darker, narrower and more contrasting breast streaks; *oreum* is rather deep-toned above, has fairly well-defined hindcollar, weak buff wash below, fairly strong breast streaking; *vividum* is



like previous but crown darker, almost chestnut, upperparts deeper-toned (almost like *mandelli*), hindcollar still better defined, streaking below bolder; *euroum* is very similar to preceding race, but slightly darker and more rufescent above, hindcollar slightly weaker, warmer buff below; *deignani* also is similar, but breast streaks broader and more triangular, slightly greyer above; *ubonense* resembles *chthonium* but crown slightly darker, breast streaks broader and blacker; *dilloni* is like last but darker above, with relatively little contrast between crown and mantle, underparts strongly washed fulvous, breast streaks weaker and browner; *smithi* has crown and upperparts darkest of all races, underparts washed with dark rufescent buff. **VOICE.** Song a repeated loud, shrill, quite high-pitched “wi-chu” or “wi-ti-chu”, sometimes with more stressed end note; described also as persistently repeated whistle of 2–3 notes, with last note strongly downslurred. In peninsular India, gives 3-note call, second note highest, e.g. “pre-tee-déér”, sometimes with short prefix “tu-” or a more distinct 2-note “tui-déér”, with first note upslurred and second downslurred; in Himalayas, 2-note “preet-dééér” with first note higher than second. Also a jolly, rapid, descending sequence, “tuituitititit-tuititititit...”, and variants. Described also as a loud, sprightly “seet-seét’sit’sit-seét-seet-suut-suut-suut-suut-seét’sit’sit...”, second or third note in each phrase highest, subsequent ones hitching alternately down scale, with much lower one followed by a slightly higher one, so that phrase trends lower; phrases repeated several times without pauses before ending abruptly. Calls with subdued, nasal “chi” and “erh” notes and rasping “rrrrrrr”.

**Habitat.** Inhabits floor and understorey of deciduous or broadleaf evergreen forest, teak forest, secondary growth, bamboo, tea gardens, scrub, sholas, lantana thickets at forest edge, thickets in ravines and along watercourses, acacia, *Ziziphus*, etc.; occurs up to 1900 m (in Bhutan mainly below 1000 m).

**Food and Feeding.** Insects, including cockroaches (Blattodea). Found in pairs or small parties. Forages on ground, rummaging among and turning over dead leaves.

**Breeding.** Mar–Aug; multi-brooded. Nest described as a large, flimsy ball or dome, with entrance at side, or a semi-dome or cup, sheltered by large upward-pointing leaf (Tenasserim and S Thailand), made of dead bamboo or other leaves, grasses, moss, plant fibres and dead twigs, lined, often scantily, with fine grasses, fine stems of maidenhair fern, moss roots, fine roots, fibres and leaf stalks, placed on ground among dead leaves, at foot of bush or clump of grass or sheltered by stone. Clutch 2–5 eggs (usually 3–4 in N India, and 2–3 in S India, S Myanmar, S Thailand and Peninsular Malaysia), white, sometimes slightly tinged greyish, greenish, yellowish, buffish or cream, usually profusely (sometimes finely) speckled with bright reddish-brown or chocolate-brown to purplish-grey or lilac; no information on incubation period; distraction display noted during this stage of cycle; nesting period 12–13 days.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common. Locally fairly common in C & E Nepal, rarer above 915 m. Frequently and regularly recorded in Bhutan. Generally common in India, where fairly common in Corbett National Park, on New Forest campus at Dehra Dun, and in Dehra Dun valley (Uttaranchal), seen intermittently in Rajaji National Park (Uttar Pradesh), common in Nameri and Kaziranga National Parks (Assam), and present elsewhere in NE India in (at least) Buxa Tiger Reserve (West Bengal), where 4.2 birds/km<sup>2</sup> in hill forest, also Barail Reserve Forest and Dibru-Saikhowa National Park (where common), in Assam, Eaglenest Wildlife Sanctuary (Arunachal Pradesh) and Dampa Tiger Reserve (Mizoram), and in Mudumalai National Park, in Tamil Nadu; in surveys in 1973–1997 in Western Ghats, found in 19 areas, including eight protected areas, namely Sultan’s Battery, Silent Valley, Parambikulam, Munmar, Periyar East, Periyar West, Tenmalai and Agastiamalai. Fairly common in China. Common in numerous protected areas in SE Asia. Common in Khao Pra-Kham and Kaeng Krachan National Parks, in Thailand. Fairly common and widespread, at least before 1970, in Cambodia. In Laos, common in Xe Pian National Biodiversity Conservation Area (NBCA), and in Xe Bang Nouan, Phou Xang He, Phou Xiang Thong and Dong Hua Sao NBCAs, and present in many other areas, including Nakai-Nam Theun NBCA. In Vietnam, present in Na Hang Nature Reserve (in N) and in nine protected areas in the Annamese lowlands, and common in Nam Bai Cat Tien National Park (Cochinchina).

**Bibliography.** Abdullali (1982), Ali & Ripley (1971), Allen (2002), Allen *et al.* (1997), Bangs (1921), Barua & Sharma (1999, 2005), Beadnell (1923), Betham (1903), Betts (1947), Bingham (1903), Birand & Pawar (2004), Chasen (1939), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Choudhury (2003), Christison *et al.* (1946), Cook (1913), Dasgupta & Basuroy (1990), David-Beaulieu (1932, 1939), Davidson (1998), Davidson *et al.* (1997), Deignan (1947, 1963), Delacour (1929), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames, Eve & Toroff (2001), Eames, Steinhilber & Ros Bansok (2002), Engelbach (1932), Evans & Timmins (1998), Evans *et al.* (2000), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Gyldestolpe (1916), Hill (2000), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1880), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Katti *et al.* (1992), King (1983), King & Han Lianxian (1991), Kinnear (1929), Lê Xuân Canh *et al.* (1997), Lekagul & Round (1991), Ludlow & Kinnear (1944), Mariens & Eck (1995), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Mohan (1997), Neath (2001), Nguyễn Duc Tu *et al.* (2001), Oates (1883), Pandey *et al.* (1994), Rasmussen & Anderton (2005), Ripley (1952), Robinson (1927), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Round (1998, 1999), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khambkhoun Khounboline (1998), Singh, A.P. (2000), Singh, P. (1995), Sivakumar *et al.* (2006), Smith *et al.* (1943), Smythies (1986), Spierenburg (2005), Stairmand (1973), Stanford & Mayr (1941), Stanford & Ticehurst (1930, 1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Thomas & Poole (2003), Ticehurst (1933), Tizard *et al.* (1997), Wickham (1929), Wiles (1980), Zacharias & Gaston (1993, 1999), Zheng Baolai (1988).

## 118. Brown-capped Babbler

### *Pellorneum fuscicapillus*

**French:** Akalat à calotte brune **German:** Braunkappen-Erdtimalie **Spanish:** Tordina Coroniparda  
**Other common names:** Sri Lanka Babbler

**Taxonomy.** Dr[ymocotaphus], *fuscicapillus* Blyth, 1849, SW Sri Lanka.

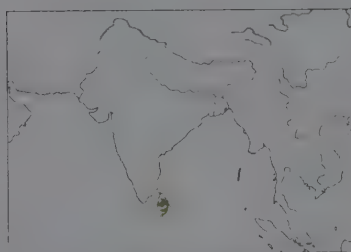
Proposed race *scortillum* (SW wet-zone lowlands) falls within range of variation of nominate, and is therefore synonymized with it. Two subspecies recognized.

**Subspecies and Distribution.**

*P. f. babaulti* (T. Wells, 1919) – dry zone of N & E Sri Lanka.

*P. f. fuscicapillus* (Blyth, 1849) – wet zone of SW & C Sri Lanka.

**Descriptive notes.** 16 cm; 30 g. Smallish, plain brown babbler with dark brown crown and bright rufous-tan underparts. Nominata race has crown, nape and upper mantle dark brown with pale buff shafts, upperparts warm-tinged mid-brown with vague shaft streaks; upperwing and tail as upperparts, fringes of outer primaries paler and contrasting with darker primary coverts, tail tipped pale salmon-buff; head side and underparts bright rufous-tan, but ear-coverts slightly pinkish and throat pale pinkish-buff, breast side streaked with colour of upperparts; underparts variable, sometimes paler, particularly on mid-belly; iris red to red-brown; bill brown, paler lower mandible; legs pinkish-brown. Sexes similar. Juvenile apparently undescribed; unlikely to be very different from adult.



dergrowth both within and outside evergreen broadleaf forest, also overgrown land near villages, scrub and jungle; foothills to 1675 m.

**Food and Feeding.** Insects, including large beetles (Coleoptera). Found in pairs or in small parties of up to five or so individuals. Spends most time on or near ground, turning over dead leaves in search of insects.

**Breeding.** Feb–Apr and Sept–Dec, mainly Mar–Apr. Nest a loose ball with large lateral entrance, or occasionally a cup, made of dead leaves and moss, lined with dead leaves, and fine leaf and fern stalks, placed on ground among dead leaves, often at foot of large tree or cardamom clump, sometimes under tea bush, in brambles, in decayed tree hollow near ground, or in crevice in bank, up to 1 m above ground. Clutch 2–3 eggs, usually 2, white or whitish (exceptionally tinged buff or greyish-green), profusely speckled or with small blotches of brown, red-brown, purplish-brown or blackish-brown; incubation by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sri Lanka EBA. Common in lowlands and hills; widespread throughout the island, including Sinharaja Forest Reserve.

**Bibliography.** Ali & Ripley (1971), David & Gosselin (2002a), Grimmett *et al.* (1998), Harrison (1999), Henry (1998), Hoffmann (1984), Hume & Oates (1889), Kotagama & Fernando (1994), Legge (1880), Phillips (1978), Rasmussen & Anderton (2005), Stattersfield *et al.* (1998).

## 119. Marsh Babbler

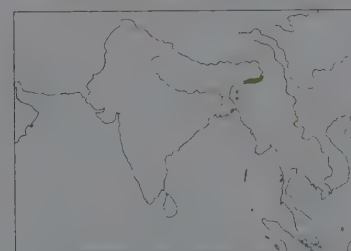
### *Pellorneum palustre*

**French:** Akalat des marais **German:** Sumpf-Erdtimalie **Spanish:** Tordina Palustre  
**Other common names:** Marsh Spotted/Spotted Marsh Babbler

**Taxonomy.** *Pellorneum palustre* Gould, 1872, Cachar, Assam, India.

Monotypic.

**Distribution.** NE India (Brahmaputra floodplains in Assam and immediately adjacent Arunachal Pradesh) and NE Bangladesh.



heavy dark brown streaks of increasing length, breast side and flanks shading dark brown with rufous-buff tinge, belly white, lower flanks, thighs and vent dark ochrous-brown; iris brown to hazel; upper mandible deep brown to horn-brown, lower mandible pale brown to horn-brown; legs flesh-brown or pale bluish-brown. Sexes similar. Juvenile apparently undescribed. **VOICE.** Highly vocal. Song an electric crackling followed by rapid downscale whinnying, “kt’kt’ (‘wheeeeeeeeyu’), described also as varied, often starting with low throaty rolling “grgrgrgrgr chew hwee” or “grgrgrgrgr weehoo” or “chackchack chuhee”, each phrase repeated many times, followed sometimes by a series of “chichi chu-hee”. High-intensity calls include a strident upslurred note with dry clattering, “kd’d’d’tuwheék-kd’d’d’d’...”, an aggravated “chik-chik-tuwheéu”, a “kt’kt’kt’kwééuu”, with the last note clear, mechanical and rather bell-like, a frantic repeated “wheétkachewwheétkachew...”. Also gives short clattery bursts without intermingled clear notes.

**Habitat.** Reeds and coarse high grass bordering forest, swamps and rivers, elephant grass, savanna grassland, grass-jungle with trees, dense grass with *Veiveria zizanioides*, bushes, shrubs and low tree-jungle on marshy ground, damp forest scrub; lowlands to 800 m.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Very skulking; works its way through dense tall grass where large mammals have created tunnels, with “canopy” c. 1–1.5 m above ground.

**Breeding.** Feb–May. Nest reportedly ball-shaped, like that of *P. ruficeps*, made of grass, lined with finer grass or a few rootlets, placed on ground or among grasses and roots, always more or less covered by matted roots or fallen debris, inside tall grass and reeds. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Assam Plains EBA. Scarce and very local; population probably declining rapidly in response to widespread loss of habitat. Known from 19 localities, 16 in India (three known to be occupied post-1980) and three in Bangladesh (one known to be occupied post-1980). Huge areas of grassland in N & NE India have been converted to farmland and plantations; moreover, seasonally flooded grassland has been affected by flood-control systems, remaining grassland areas are under great grazing and harvesting pressure, and grasslands are very poorly represented and poorly managed within protected areas. In India, species is present in Dibru-Saikhowa, Kaziranga, Manas and Nameri National Parks, also Eaglenest Wildlife Sanctuary; hard to assess density owing to reclusive behaviour, but regularly seen at these sites.

**Bibliography.** Ali & Ripley (1971), Allen (2002), Anon. (2006d), Barua & Sharma (1999), Butchart & Stattersfield (2004), Choudhury (2000, 2003, 2006), Collar *et al.* (2001), Grimmett *et al.* (1998), Rasmussen & Anderton (2005), Singh (1995), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevens (1914), Thompson *et al.* (1993).



## 120. Spot-throated Babbler

### *Pellorneum albiventris*

**French:** Akalat à gorge tachetée **German:** Weißbauch-Erdtimalie **Spanish:** Tordina Golipinta  
**Other common names:** Brown/Plain Brown/White-bellied Babbler

**Taxonomy.** *Neornis albiventris* Godwin-Austen, 1877, Sengmai, Manipur, India.  
Four subspecies recognized.

#### Subspecies and Distribution

*P. a. ignotum* Hume, 1877 – SE Bhutan E to NE India (Arunachal Pradesh) and adjacent N Myanmar.  
*P. a. albiventris* (Godwin-Austen, 1877) – NE Indian hill states S of R Brahmaputra, also NE Bangladesh and W Myanmar.

*P. a. cinnamomeum* (Rippon, 1900) – E Myanmar, NW Thailand, S China (W & SW Yunnan), NW Laos and C & S Vietnam (C & S Annam).

*P. a. pusillum* (Delacour, 1927) – S China (SE Yunnan E to SW Guangxi) and N Vietnam (N Tonkin).



**Descriptive notes.** 14–15 cm; 21–22 g. Non-descript small round-tailed babbler, olive-brown above and below, with lightly stippled whitish throat and white mid-belly. Nominative race has crown, neck side and back olive-tinged mid-brown with very indistinct darker scaling, becoming slightly warmer on plain rear upperparts, upwearing and tail; face as upperparts but paler; chin, submoustachial area and throat greyish-white with greyish-buff flecks, breast ochreous-buff, shading to ochre-tinged olive-brown on breast side, flanks, thighs and vent; iris hazel to reddish-brown; upper mandible black or brown, lower mandible brighter; legs

brownish-flesh to purplish-horn. Sexes similar. Juvenile is warmer than adult, with rufescent edges of flight-feathers and greater wing-coverts. Race *ignotum* has greyish wash on lores and supercilium, greyish-brown pectoral band, dark of flanks more clear-cut from white belly, shorter tail, bill less well marked; *cinnamomeum* has more distinct dark chevron-like spots on throat, and paler rufous-buff underparts with little ventral white; *pusillum* has darker grey face, pale rufous base colour of chin and throat, darker and greyer flanks. Voice. Has surprisingly rich song like that of a thrush or chat (Turdidae), complex and quickly delivered but with much repetition: a long, loud relaxed series of simple mimicked phrases of clear short whistles and hard ringing notes, each phrase repeated a few times (often without a pause), sometimes with subdued guttural buzzy nasal notes. Presumed female may antiphonally interject a fast high metronomic downward-slicing “chiew-chiew-chiew...”. Calls include harsh angry buzzing “chrrr-chrrr-chrrr-chrrr...” and slightly explosive stony “tip” or “tchip” notes, quickly repeated.

**Habitat.** Scrub, secondary growth, bamboo, grassland, clearings, undergrowth in pine forest; from plains to 1830 m in Indian Subcontinent, 280–2135 m generally in SE Asia but 1100–2100 m in Thailand.

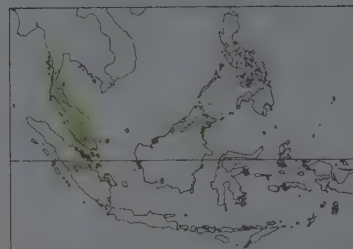
**Food and Feeding.** Insects. Shy and very skulking; in pairs near the ground in dense cover.

**Breeding.** Apr–Jul. Nest a small, compact globe or dome, sometimes semi-dome (or deep cup), made of grasses and bamboo leaves, lined with grasses and moss roots, placed in bamboo clump, bush, among tree roots or in grass or weed clump, on or 0.3–1.2 m above ground, sometimes a little higher. Clutch 2–5 eggs (usually 3–4 in India, and 3 in Myanmar), reddish-white or warm brick to pale cream or pale pink, profusely covered by speckles and tiny blotches of rather dark reddish-brown to pinkish-red; incubation by female; no information on duration of incubation and nesting periods. Occasional brood parasitism by Large Hawk-cuckoo (*Cuculus sparverioideus*) reported.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare in Bhutan, where known from five specimens, all from Deothang area in 1930s. Status in India uncertain, with few records; rare in Nameri National Park and uncommon in Dibru-Saikhowa National Parks (both Assam). Presumably a rare resident in Bangladesh, where one recent record. In China, rare in Yunnan; recently recorded in Guangxi in Shiwandashan National Nature Reserve and Diding Nature Reserve, but uncommon in both. Fairly common to common in SE Asian part of range. Fairly common in Doi Inthanon National Park and scarce in Doi Suthup-Pui National Park, in Thailand. Present in Dong Hua Sao and Nakai-Nam Theun National Biodiversity Conservation Areas, in Laos. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves and common all over Da Lat Plateau (S Annam), and in three protected areas in the Annamese lowlands.

**Bibliography.** Ali & Ripley (1971), Barua & Sharma (2005), Bingham (1903), Birand & Pawar (2004), Cheng Tsohsin (1987), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Delacour *et al.* (1928), Dickinson (1970), Eames (1995), Eames *et al.* (2001), Engelbach (1932), Grimmett *et al.* (1998), Harrington (1909, 1914a), Hopwood & Mackenzie (1917), Lekagul & Round (1991), Ludlow & Kinnear (1937, 1944), Rasmussen & Anderton (2005), Ripley (1949, 1952), Rippon (1901), Robbins *et al.* (2006), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Singh (1995), Smythies (1940, 1949), Spierenburg (2005), Stanford & Ticehurst (1938), Stevens (1914), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Thompson *et al.* (1993), Tizard *et al.* (1997).



sometimes with grey streaks, breast variably washed grey-brown and sometimes slightly streaked, remaining underparts silky whitish-buff; iris red to brown; upper mandible grey to black, lower mandible usually paler or blue-grey (bill much heavier than that of *M. affine*); legs grey or blue-grey. Sexes similar. Juvenile has moustache less distinct than adult, and uniformly flesh-coloured to yellowish lower mandible. Race *cinereocapilla* differs in having crown greyer, darker towards front, head side greyer and more clearly defined, breastband pale grey, and lower underparts silky greyish-white. Voice. Song a series of usually 3–6 well-spaced, clear, sweet whistled notes, “ti-tu-ti-tu” or “ti-tie-ti-ti-tu”, etc., usually lasting 2–3 seconds and sometimes descending somewhat towards end; female may give antiphonal harsh “tchew” or “tchip” notes. In N Borneo (Sabah) a short “doo-da-doo” followed by 4 descending notes, other sex giving counterpoint notes. Call a repeated soft but quite explosive “whit”, interspersed with buzzing “bzzi” notes.

**Habitat.** Primary broadleaf evergreen forest, peatswamp-forest, regenerating forests, heavily and selectively logged forests, upland heath, old rubber plantations and rarely *Albizia*. Occurs at up to 900 m in Thailand and Peninsular Malaysia, to 800 m in Sumatra; to upper margins of alluvial terraces to 915 m, rarely 1220 m, in Borneo.

**Food and Feeding.** Insects, including black beetles (Coleoptera) and locustids. Forages mostly in middle storey, at average height 4–6 m, but in depauperate kerangas forest may feed also from ground. Generally gleans foliage; can forage on vertical trunks, even upside-down, probing bark. Usually in small groups, sometimes associating with mixed flocks.

**Breeding.** Feb–Aug in SE Asia and Sumatra, Apr–May in Singapore; Oct–Jan (at least) and breeding-condition birds May in N Borneo (Sabah), with juveniles in May–Jun in Kalimantan. Nest an open cup, 1 m off ground in sapling; 2 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common to common in most of range. Rare in Singapore. Locally fairly common in Borneo and Sumatra, but common in Sabah. Present in Khao Pra-Bang Kham Wildlife Sanctuary, in Thailand, Taman Negara National Park, in Peninsular Malaysia, and Gunung Leuser, Bukit Tigapuluh and Way Kambas National Parks (scarce), in Sumatra. In Borneo, present in Danum Ulu Conservation Area, in Sabah, Similajau National Park, in Sarawak, and Tanjung Puting National Park (uncommon), in S Kalimantan.

**Bibliography.** Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), David & Gosselin (2002a), Deignan (1963), Duckworth *et al.* (1997), Holmes (1996), Hume & Davison (1878), Johns (1989), Lambrecht (1992), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Nash & Nash (1988), O’Brien & Kinnaird (1996), Parrott & Andrew (1996), Rajithurai (1996), Robinson (2002), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Thompson (1966), Voous (1950), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 122. Sooty-capped Babbler

### *Malacopteron affine*

**French:** Akalat affin **German:** Schwarzscheitel-Zweigimalie **Spanish:** Tordina Coronioscura  
**Other common names:** Sooty-headed/Plain Babbler, Small Tree-babbler

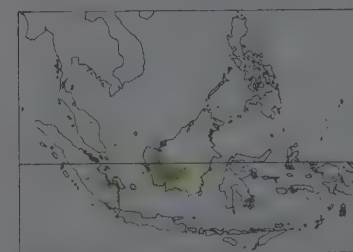
**Taxonomy.** *Tr[ichastoma]. affine* Blyth, 1842, Singapore.

Has often been treated as monotypic, but race *phoeniceum* appears sufficiently distinctive to warrant recognition. Birds from Banyak Is (off W Sumatra) separated as race *notatum* on basis of size difference, but this was later shown to be non-existent. Two subspecies recognized.

#### Subspecies and Distribution

*M. a. affine* (Blyth, 1842) – S Thailand, Peninsular Malaysia and Sumatra (including Banyak Is, off W coast).

*M. a. phoeniceum* Deignan, 1950 – Borneo.



**Descriptive notes.** 15.5–17 cm; 14–21 g. Rather dark-backed hook-billed babbler with contrasting whitish underside, vague grey breastband, and dull chestnut tail. Nominative race has crown blackish-brown, upperparts darkish olive-brown, shading paler and more rufescent on rump; upwearing plain darkish brown, tail dull chestnut, richest at base; lores, supercilium and ear-coverts rather pale grey, becoming whiter on lower face, with submoustachial area white with vague grey stippling; chin and throat silky white, lower throat and upper breast with vague grey streaks, breast washed grey, shading back to silky whitish on lower underparts; iris red,

brown or chestnut; upper mandible dark horn to slate, lower mandible usually paler; legs grey to bluish-slate. Sexes similar. Juvenile has lower mandible pale, foreneck unstreaked, crown paler, browner and almost concolorous with rufescent-tinged mantle, wing feathers edged rufous, tail brighter. Race *phoeniceum* has brown cap. Voice. Song of two types. First a series of usually 6–9 clear, slow, airy, rising and falling whistles, in variable combination but usually spaced as (e.g.) 2, 3 and 3, “phu-phi, phu-phoo-phi, phi-phi-phi”, usually lasting 4–7 seconds; second (characterized as “errand-boy” whistling) a variable, cheerful and clearer version of first, usually in two 3-note phrases, “whi-whi-whi”, sometimes a faster “chut-whi-whi-whi-whi-whi-whi-whi”, sometimes introduced by short scratchy or jumbled notes. Calls include short, sharp “whit” or “pi-nwit” (sometimes used by female to accompany primary song of male), and harsh scolding rattles when alarmed.

**Habitat.** Fades and naturally disturbed areas of primary broadleaf evergreen forest, e.g. along rivers or tracks, peatswamp-forest, selectively logged forest, favouring secondary growth and forest edge, *Albizia*, overgrown rubber and oil palm (*Elaeis*); on Mt Mulu, in Borneo, present in riparian habitat only. Level lowlands in Thailand; to 455 m in SE Asia; up to 700 m in Sumatra.

## Genus MALACOPTERON Eyton, 1839

## 121. Moustached Babbler

### *Malacopteron magnirostre*

**French:** Akalat moustachu **German:** Bartstreif-Zweigimalie **Spanish:** Tordina Bigotuda  
**Other common names:** Brown-headed Babbler/Tree-babbler

**Taxonomy.** *Alcippe magnirostris* F. Moore, 1854, Malacca, Peninsular Malaysia.

Proposed race *flavum* (from Anambas Is) merged with nominate. Two subspecies recognized.

#### Subspecies and Distribution

*M. m. magnirostre* (F. Moore, 1854) – extreme S Myanmar, W & S Thailand, Peninsular Malaysia (including Tioman Is, Anambas Is, Singapore and Sumatra).

*M. m. cinereocapilla* (Salvadori, 1888) – Borneo.



**Food and Feeding.** Ants (Formicidae), beetles (Coleoptera) and caterpillars. Average foraging height 6–5 m. Gleans from foliage. Often in small parties in smaller trees and bushes, often in liana tangles.

**Breeding.** Apr–May in SE Asia; in Borneo, nest-building in Oct in Brunei, breeding in Jun–Oct and Jan in Sabah, and juveniles May–Jun in Kalimantan. Nest a loose shallow cup, made of dead leaves, twigs and fibres stripped from tree trunk, placed in triangle formed by stems of two saplings and creeper or among dead leaves attached to hanging dead twigs, 1–7 m above ground. Clutch 2 eggs, pink, with numerous pin-spots and blotches of reddish-brown over occasional clouds of lilac, with dense cap of deep red-brown and purplish-brown. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Rare to locally common in continental part of range; common in Taman Negara National Park, in Peninsular Malaysia. Common throughout lowland mixed dipterocarp forests in Borneo, and common in Sabah, including Danum Valley Conservation Area; frequent in Berau district forest, in E Kalimantan; present in Similajau National Park (Sarawak), and uncommon in Tanjung Puting National Park (S Kalimantan). In Sumatra, present in Gunung Leuser and Way Kambas National Parks, common in latter; recorded as common in the now destroyed Padang-Sugihan Wildlife Reserve, in S Sumatra. A Sundaic lowland-forest species, thus highly susceptible to the extensive forest destruction throughout its range; ability to survive in forest edge and secondary formations, however, implies that it is not immediately at risk.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth *et al.* (1997), Eames (2005), Johns (1989), Lambert (1992), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Nash, S.V. & Nash (1985a, 1988), O'Brien & Kinnaird (1996), Parrott & Andrew (1996), Robson (2000), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Voous (1950), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Darjono & Noor (1991).

## 123. Scaly-crowned Babbler

### *Malacopteron cinereum*

**French:** Akalat à calotte maillée

**Spanish:** Tordina Coroniescamada

**German:** Rotstirn-Zweigimalie

**Other common names:** Smaller/Lesser Red-headed Babbler/Tree-babbler

**Taxonomy.** *Malacopteron cinereus* [sic] Eyton, 1839, Peninsular Malaysia.

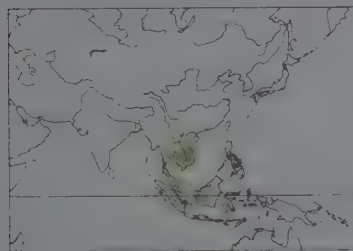
**Proposed race bungeense** (from N Natuna Is) merged with nominate. Four subspecies recognized.

**Subspecies and Distribution.** *M. c. indochinense* (Robinson & Kloss, 1921) – E Thailand, Cambodia, C & S Laos and Vietnam (S from SE Tonkin).

*M. c. cinereum* Eyton, 1839 – S Thailand, Peninsular Malaysia, Sumatra (including islands off E coast), N Natuna Is and Borneo.

*M. c. niasense* (Riley, 1937) – Nias I, off W Sumatra.

*M. c. rufifrons* Cabanis, 1851 – coastal S Java.



**Descriptive notes.** 14–16 cm; 14–21 g. Rather similar to *M. affine*, but paler above, with black-tipped dull rufous anterior crown, pale legs. Nominative race has erectile rufous crown feathers tipped with black (difficult to discern in field), blackish hindcrown and nape; upperparts and upperwing olive-brown, tail dull rufescent, strongest at base; lores, supercilium and area around eye pale brown with tiny white spotting, cheek and ear-coverts greyish-brown with buffy-white shaft streaks, submoustachial area buffy white with vague greyish flecks; chin to vent whitish, shadow of greyish breastband, flanks more buff-grey;

iris crimson to brownish-grey; upper mandible greyish-horn to black, lower mandible often paler; legs grey or flesh, even whitish. Sexes similar. Juvenile is similar to adult. Race *indochinense* has hindcrown and nape concolorous with upperparts; *rufifrons* is very like previous, but rufous extends onto hindcrown and has much smaller black tips, outer fringes of flight-feathers rufescent; *niasense* is like nominate but darker and larger, with larger bill. **VOICE.** Song variable, with four main parts which can be combined in various ways: first part a rapidly repeated, hard, stressed “dit-dit-dit-dit-dit-...” or “du-du-dit-dit-dit-...”; second a rapid, usually gradually descending “du-du-du-du-du-...”; third a more spaced, gradually ascending “phu-phu-phu-phu” and “phu-pu-pi-pee”; and fourth a rapid, high-pitched, even “wi-wi-wi-wi-wi-wi-wu”, “wi-wi-dududududu” or similar, slower at end or beginning. When in flocks, several individuals may sing simultaneously. Calls with short subdued “chit-chit, chreu-chreu...” or combinations of loud sharp shrill “chit”, “whit”, “cheu” and “titu” notes; calls may be interspersed with third and fourth song types (probably by female).

**Habitat.** Primary broadleaf evergreen forest, second growth, coastal swamp-forest, upland kerangas, selectively logged forest and, rarely, *Albizia*; at Mt Mulu (Borneo) confined to flat lowland forest on alluvial terraces and floodplains, in Java open coastal forest and low-lying primary forest. To 800 m generally, but 1200 m in Sumatra.

**Food and Feeding.** Invertebrates, including beetles (Coleoptera), surprisingly large locustids, ants (Formicidae), grubs, spiders (Araneae); also some fruits. Parties, sometimes large, move through middle storey; active, agile and rather noisy. Occasionally descends to near ground.

**Breeding.** Feb–Oct in SE Asia; in Borneo, Jul–Aug in Sarawak, breeding-condition birds May–Jul in Sabah, and May–Sept in Kalimantan. Nest, built by both sexes over 10 or more days, a neat, fairly flimsy cup, base made of dry leaves under layer of strips of palm leaves and coarse grass blades, lined with pad of fine fibre, brown downy seeds and black hair-like palm fibres, placed from near ground to up to 1.2 m up in bush or in fork of sapling. Clutch 2 eggs, whitish to creamy-brown or pale green, densely and evenly marked with pale brown or rich red-brown spots over underlying markings of pale grey or dark brown scribbling; incubation period at least 9 days. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common resident in SE Asian range, but apparently local in Cambodia. Common in Khao Pra-Bang Kham Wildlife Sanctuary, in Thailand, and Taman Negara National Park, in Peninsular Malaysia. Common in Phou Xang He National Biodiversity Conservation Area (NBCA), Phou Xiang Thong and Xe Bang Nouan NBCAs, locally frequent in Nam Kading NBCA, and present in Xe Pian, Nakai-Nam Theun and Hin Namno NBCAs, all in Laos. In Vietnam, fairly common in Cuc Phuong and Bach Ma National Parks, and

present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (S Annam), and in ten protected areas in the Annamese lowlands; fairly common in Nam Bai Cat Tien National Park (Cochinchina). In Borneo, common in Sabah, including Danum Valley Conservation Area, present in Similajau National Park (Sarawak), and common in Tanjung Puting National Park (S Kalimantan). Locally common in Sumatra, mainly in primary forest; present in Gunung Leuser, Bukit Tigapuluh and Way Kambas (common) National Parks. Present in Ujung Kulon National Park, in W Java. Numbers decline in response to fragmentation of lowland-forest habitat.

**Bibliography.** Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), David-Beaulieu (1932), Davidson *et al.* (1997), Deignan (1963), Duckworth & Kelsch (1988), Duckworth, Tizard *et al.* (1998), Duckworth, Wilkinson *et al.* (1997), Eames (1995), Eames *et al.* (2001), Engelbach (1932), Evans & Timmins (1998), Evans *et al.* (2000), Hartert (1895), Hoogerwerf (1967, 1971), Bin Jalan & Gaidikas (1987), Johns (1989), Lambert & Collar (2002), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lekagul & Round (1991), MacKinnon (1988), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Meyer de Schauensee & Ripley (1940b), Nash & Nash (1988), Neath (2001), Oberholser (1932), O'Brien & Kinnaird (1996), Parrott & Andrew (1996), Robinson (1928), Robinson & Kloss (1924b), Robson (2000), Robson, Eames, Nguyễn C. & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Sheldon *et al.* (2001), Smythies & Davison (1999), Sody (1956), Thewlis *et al.* (1996), Thomas & Poole (2003), Thompson (1966), Timmins & Trinh Viet Cuong (1999), Timmins & Wilkinson (1996), Voous (1950), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 124. Rufous-crowned Babbler

### *Malacopteron magnum*

**French:** Akalat géant

**German:** Rotscheitel-Zweigimalie

**Spanish:** Tordina Magna

**Other common names:** Red-headed Babbler/Tree-babbler, Greater/Larger Red-headed Babbler/Tree-babbler

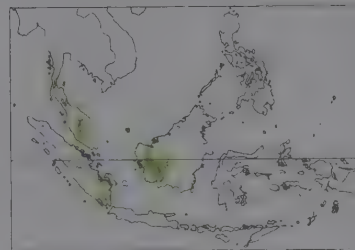
**Taxonomy.** *Malacopteron magnum* Eyton, 1839, Peninsular Malaysia.

Forms a superspecies with *M. palawanense*; sometimes thought possibly conspecific. Two subspecies recognized.

**Subspecies and Distribution.**

*M. m. magnum* Eyton, 1839 – extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, Sumatra, N Natuna Is and Borneo (except N).

*M. m. saba* Chasen & Kloss, 1930 – N Borneo.



**Descriptive notes.** 18–19.5 cm; 20–36 g. Mid-sized olive-brown and greyish hook-billed babbler with dull rufous crown, black nape and rufous-tinged tail. Nominative race has crown dull rufous with vague blackish scaling, becoming all black on hindcrown and nape; mantle, scapulars and back greyish-tinged olive-brown, shading darker on upperwing and to dull rufous on rump and tail; lores, supercilium, ear-coverts and lower face pale greyish with vague white streaks and some grey flecks; chin to mid-belly off-white with vague broad pale greyish streaking, lower underparts plain whitish or greyish-white; iris red to reddish-

brown; upper mandible greyish-brown, lower mandible paler horn-grey; legs pale slate to bluish-grey. Sexes similar. Juvenile is similar to adult. Race *saba* has dull rufous extending onto hindcrown, thereby confining black to nape. **VOICE.** Song consists of three main parts: first part a series of clear well-spaced notes, “phu-phu-phi-phi”, louder and more spaced than that of *M. cinereum* and usually not descending; second part a series of well-spaced even notes, sometimes slightly descending or hurried towards end, e.g. “chuwee-chuwee-chuwee-chuwu” or “chu-chi-chi-chi-chu-chu-chu-chu”; third a well-spaced, loud, very even-pitched “chut-chut chut-chut-chut-chut-chut”. When singing, male may give first type, followed, after an interval, by second type, and so on. Series of “chut” notes may be given in duet with first two song types (probably by female).

**Habitat.** Primary broadleaf evergreen forest, mixed dipterocarp forest, disturbed and selectively logged forest, upland heath and stunted ridgetop forest, transitional kerangas forest, tidal riverine swamp-forest and in Sumatra even mangroves; also abandoned rubber and older *Albizia* plantations, and rarely cocoa; appears to prefer primary forest. To 455 m in SE Asia generally; to 800 m in Sumatra and 1000 m in Borneo (Kalimantan).

**Food and Feeding.** Insects, including black beetles (Coleoptera), soft greenish insects, grasshoppers (Orthoptera), ants (Formicidae); some seeds. Forages mostly in middle storey, also in lower branches of taller trees and in undergrowth, not descending to ground; gleans foliage. Found in pairs or small parties, sometimes in association with other species, including other babblers, in bird waves.

**Breeding.** Mar–May in SE Asia; May–Jun in Sumatra; in Borneo, Aug–Sept in Sarawak and Mar, May–Jul and Oct in Sabah. Nest described as a cup, made of dead leaves, grass and dead moss, lined with roots, placed up to 1 m above ground in thick bush or small sapling. Clutch 2 eggs, rich salmon-pink with crimson flush at large end, with wavy lines and few spots of deep crimson-brown, fairly numerous at large end but sparse elsewhere, or pale blue with dark reddish to crimson blotches and spots. No further information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Uncommon to fairly common from S Myanmar and S Thailand into Peninsular Malaysia; less common than *M. cinereum* in Sumatra. Common in Taman Negara National Park, in Peninsular Malaysia. Present in Gunung Leuser, Bukit Tigapuluh and Way Kambas (common) National Parks, in Sumatra. Common throughout lowland mixed dipterocarp forest in Borneo, including Danum Valley Conservation Area (Sabah); frequent in Berau district forest (E Kalimantan), and very common at Barito Ulu; present in Similajau National Park (Sarawak), and common in Tanjung Puting National Park (S Kalimantan). As a Sundaic lowland-forest species, this babbler is highly susceptible to extensive forest destruction throughout its range; ability to survive in second growth implies no immediate risk, although numbers decline in response to logging of lowland-forest habitat.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth & Kelsch (1988), Duckworth *et al.* (1997), Eames (2005), Hartert (1895), Holmes (1966), Hume & Davison (1878), Johns (1989), Lambert (1992), Lambert & Collar (2002), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Nash & Nash (1988), O'Brien & Kinnaird (1996), Parrott & Andrew (1996), Robinson (1928), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Stattersfield & Capper (2000), Thompson (1966), Voous (1950), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

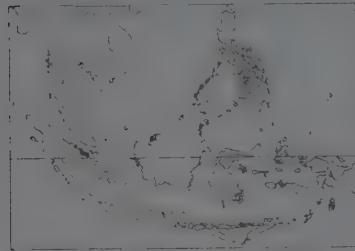


## 125. Melodious Babbler

### *Malacopteron palawanense*

**French:** Akalat de Palawan **German:** Palawanzweigimalie **Spanish:** Tordina de Palawan  
**Other common names:** Palawan Babbler, Red-headed Tree-babbler

**Taxonomy.** *Malacopteron palawanense* Büttikofer, 1895. Puerto Princesa, Palawan, Philippines. Forms a superspecies with *M. magnum*; sometimes thought possibly conspecific. Monotypic.  
**Distribution.** Palawan and Balabac, in W Philippine Is.



**Descriptive notes.** 17–18 cm; 28–37 g. Medium-sized olive-brown and buffy hook-billed babbler with dull rufescent forecrown, rump and tail. Forecrown is dull rufescent brown with vague blackish scaling, becoming browner on hindcrown and nape; mantle, scapulars and back rufescent olive-brown, shading darker on upperwing and to dull rufous on rump and tail; lores, supercilium and area around eye ashy grey, ear-coverts and lower face pale greyish-tan with vague buffy shaft streaks and grey flecks, submoustachial area greyish with whitish flecks; chin, throat and upper breast silky white with very indistinct and sparse grey streaking, breast and flanks greyish-buff, shading paler and buffier on mid-belly; iris yellow to almost white; upper mandible black, lower mandible paler; legs greyish slate-blue. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a loud series of mournful clear whistles increasing in volume, with alternating high and low notes, e.g. “hi-hu-hi-hu-hi” or “hi-hu-hi-hu-hi-hu-hi”, accompanied by stressed antiphonal harsh whiplash, “whit-whit-whit-whit”, or slightly uneven weak “chi-chi-chi-chi”, sometimes given by more than one other bird.

**Habitat.** Primary and old secondary lowland evergreen forest, bamboo, forest edge, usually in tangles and vines in middle storey or in tops of low trees; lowlands to perhaps 100 m.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Forages singly or in small groups, rather sluggishly, in middle and sometimes lower storey; disturbs prey from bunches of dead leaves trapped in bamboo canopy.

**Breeding.** Birds in breeding condition in Feb–Mar and May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Palawan EBA. Formerly considered Endangered. Uncommon. Possibly an extreme lowland-forest specialist, but in mid-1990s reported as being at good densities in remaining pockets of such habitat. Not known to be present in St Paul’s Subterranean River National Park, however, and best “protected” area for it is apparently Iwahig Penal Colony, outside Puerto Princesa.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (1991), Hachisuka (1935), Hartley & McGowan (1991), Hornsokov (1996), Kennedy *et al.* (2000), duPont (1971), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Voous (1950), Whitehead (1890).

## Genus *OPHRYDORNIS* Büttikofer, 1895

## 126. Grey-breasted Babbler

### *Ophrydornis albogularis*

**French:** Akalat à gorge blanche **German:** Graubrust-Zweigimalie **Spanish:** Tordina Pechigris  
**Other common names:** White-throated Babbler

**Taxonomy.** *S[etaria]*, *albogularis* Blyth, 1844. “Singapore”.

Usually placed in genus *Malacopteron*, but differs in appearance and behaviour, and bill rather more broad-based. Two subspecies recognized.

**Subspecies and Distribution.**

*O. a. albogularis* (Blyth, 1844) – Peninsular Malaysia and Sumatra.

*O. a. moultani* Robinson & Kloss, 1919 – Borneo.



**Descriptive notes.** 14–16 cm; 13–23 g. Small hook-billed, rather short-tailed babbler, rather muscipid-like in appearance, with dark grey head, white supercilium, white underparts with pale grey breastband. Nomininate race has crown and ear-coverts dark sooty grey, intersected by narrow white supercilium from above lores to just behind eye; lores and area under eye to lower ear-coverts blackish-grey; upperparts and upperwing dark greyish olive-brown, becoming paler and more chestnut on rump and base of tail; chin, submoustachial area and throat pure white, shading abruptly to ashy-grey breastband, this in turn shading abruptly

to creamy-white mid-belly and buffy flanks, thighs and vent; iris crimson; bill black above, grey-blue below; legs blue to bluish-grey. Sexes similar. Juvenile apparently undescribed. Race *moultani* has paler buff flanks than nominate, and in N Borneo (Sabah) lores described as yellow. **Voice.** Song a rather long, subdued, discordant series of ascending “whu-whi”, “whit-whu”, and “uu-whu” phrases (and variants), sometimes interspersed with short “chit” notes. Call “trr”; in alarm this becomes persistent churring.

**Habitat.** Understorey of forest, generally preferring forests on poor soils below the steepland boundary or in alluvial terraces: broadleaf evergreen forest, lightly logged forest, freshwater peat-swamp forest dominated by “ramin” (*Grisebahi*), and in some areas confined to lowland peat-swamp and kerangas forest; also *Albizia* *falcataria* groves, dryland dipterocarp forest, mixed dipterocarp forest, and, in Barito Ulu (Kalamantan, in Borneo), steep rocky terrain. In E Kalimantan found three times in primary forest on sandy soil, once in dry creek and twice in swampy forest. Lowlands in Peninsular Malaysia: 120–915 m in Borneo.

**Food and Feeding.** Insects, including ants (Formicidae) and hoppers (Homoptera). Found singly or in pairs, sometimes in small parties of up to five individuals; avoids bird waves. Hops sideways along branches. Forages from just above ground to 2 m, movements resembling *Stachyris* more than *Malacopteron*.

**Breeding.** Jul–Aug in Sumatra and May–Jun in Borneo. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Scarce and local in Peninsular Malaysia, notably (at least in 1990s) at Pasoh Forest Reserve. Sparse in lowland forests of Borneo, and either rare or absent in N & E of island, but common on R Murung and E Busang (Barito Ulu); present in Similajau National Park (Sarawak), Gunung Palung National Park (W Kalimantan) and Tanjung Puting National Park (S Kalimantan). Few records from Sumatra, but probably overlooked; present in Bukit Tigapuluh and Way Kambas (rare) National Parks. Swamp-forest destruction has been so extensive in Indonesian Borneo that it was predicted in 2000 that all primary formations would have disappeared by 2010, and situation is little different in Malaysian Borneo; the species’ ability to survive in second growth, and to some extent in other habitats, however, implies that it is not immediately at risk. Nonetheless, numbers decline in response to fragmentation of lowland-forest habitat.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Danielsen & Heggard (1995), Duckworth & Kersh (1988), Duckworth *et al.* (1997), Dutton *et al.* (1991), Gönner (2000), Holmes (1996, 1997), Holmes & Wall (1989), Lambert & Collar (2002), van Marle & Voous (1988), Medway & Wells (1970, 1976), Nash & Nash (1988), Parrott & Andrew (1996), Robson (2000), Sheldon (1987), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Voous (1950), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## Genus *MALACOCINCLA* Blyth, 1845

## 127. Abbott’s Babbler

### *Malacocincla abbotti*

**French:** Akalat d’Abbott **German:** Rotschwanz-Maustimalie **Spanish:** Tordina de Abbott  
**Other common names:** Common Brown Babbler

**Taxonomy.** *[Malacocincla]*, *Abbotti* Blyth, 1845, Ramree Island, Arakan, Lower Myanmar.

Often placed in genus *Trichastoma*. Mainland races weakly differentiated, and perhaps only *concreta* and *baweana* worthy of recognition. Proposed races *amabile* (low elevations from E Nepal E to E Assam, in NE India) and *rufescentior* (from S Myanmar and S Thailand) both merged with nominate. Individuals of this species observed in SE part of NE Thailand, SW Laos and adjacent NE Cambodia have not been assigned to race. Eight subspecies tentatively recognized.

**Subspecies and Distribution.**

*M. a. abbotti* Blyth, 1845 – Nepal and extreme S Bhutan E to NE Indian states, E Bangladesh, SW & S Myanmar (including Tenasserim), W & S Thailand and NW Peninsular Malaysia.

*M. a. krishnarajui* Ripley & Beehler, 1985 – Eastern Ghats (Orissa, NE Andhra Pradesh), in E India.

*M. a. altera* (Sims, 1957) – C Laos and Vietnam (N & C Annam).

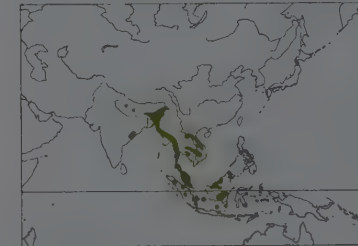
*M. a. williamsoni* Deignan, 1948 – E Thailand E to E Cambodia and S Vietnam (Cochinchina).

*M. a. olivacea* (Strickland, 1847) – SE Thailand.

*M. a. obscurior* Deignan, 1948 – extreme SE Thailand, Peninsular Malaysia (except NW), Singapore and Sumatra.

*M. a. concreta* Büttikofer, 1895 – Belitung I, and Borneo (including Matasiri I, off S).

*M. a. baweana* Oberholser, 1917 – Bawean I, off NE Java.



**Descriptive notes.** 15–17 cm; 26–32 g. Medium-sized hook-billed babbler, chunky, rather short-tailed and nondescript, brown above and greyish-white to buff-tan below, with vague eyering and eyebrow. Nomininate race has crown, upperparts and upperwing dull olive-brown, crown with weak buff shaft streaks (not visible in field), tail slightly browner and with strong rufescent wash basally; lores and supercilium greyish, ear-coverts and neck side buffy olive-brown, submoustachial area buffish-grey; chin, throat and upper breast greyish-white, shading on breast side, flanks and belly to buffy rufous and on lower flanks, thighs and vent to bright

rufous-buff; iris light brown or reddish-brown; upper mandible blackish-horn, lower mandible paler; legs brownish-flesh. Sexes similar. Juvenile has crown and upperparts dark rufescent brown (similar to adult *Trichastoma bicolor*). Race *krishnarajui* has more olive upperparts than nominate, with uppertail and rump deeper brown, more extensive greyish-white on upper breast, flanks paler, vent richer rufescent; *williamsoni* is darker and more olivaceous-brown above than nominate, with darker crown; *altera* is like previous, but crown duller, forehead less streaked, upperparts duller (more chestnut), throat greyer and more distinctly streaked, breast more ashy-washed, flanks paler; *olivacea* is very like nominate, but throat and breast dirtier greyish-white with very vague streaking; *obscurior* is slightly darker above, slightly more rufescent on lower underparts; *concreta* is much more uniformly greyish-white below, with much more restricted and paler buff-rufous area on lower flanks to vent; *baweana* resembles last, but paler above and below, even less rufescent on rump and tail. **Voice.** Song consists of repeated variable loud jolly phrases, usually of 3 (sometimes up to 5) well-spaced notes, e.g. “chuu-woo-woo, wuu-woo-wuu” and “wi-wu-yu-wi”, also described as variable short series of 3–4 rich, fluty, liquid, slurred, short whistled notes, some halting, some hurried, usually in alternating directions, e.g. “fwew, fwewfwewééé!... fwew, fwewfwé-fwew... fwew, fwewfwéew”. In duet one bird sings clear whistled “wee-oh wee-oh a-where” or “peevs-wherea where”, other giving 1–3 descending, plaintive calls. In Sumatra consists of 6 notes with rising inflection, a barely audible introductory note followed by 4 evenly spaced slurred whistles and a final loud upslurred whistle, female uttering 2–3 sharp notes in unsynchronized duet. Calls include soft mewling notes, a pulsing, purring trill when agitated, and short, harsh, explosive “cheu” notes interspersed with high nervous “wer” notes; evening group-calling involves spattering “tu-churr churr churr churr”, low and slurred, last note higher and inflected.

**Habitat.** Degraded broadleaf evergreen and semi-evergreen forest, riverine forest and swampy coastal scrub, peat-swamp-forest, back edges of mangroves, nipa palm and transitional habitats, mixed plantation-natural forest, secondary growth, forest edges along banks of streams, normally



frequents thickets and edge habitat, especially second growth, only exceptionally on fringe of primary forest. In Borneo prefers low-altitude riverine and coastal areas, coastal scrub, especially with nipa or mangroves, fire-padang scrubland and secondary or poor-soil forests. Up to 1100 m. **Food and Feeding.** Insects and small invertebrates. Solitary or in pairs, on or near ground. Forages with deliberate slow movements among leaf litter, investigating niches in low tangled vegetation; often tame.

**Breeding.** Apr–May in Bhutan, Jan–Sept in SE Asia, at least Dec–Jan in Sumatra, and in Borneo May–Jun in Brunei and Jul–Aug in Kalimantan; possibly multi-brooded, second brood documented for at least 38% of pairs in one season in Thailand. Nest a bulky, open, sometimes deep cup, made of dead leaves, bracken fronds, weed stems, moss, grasses, black fern roots and rootlets, lined, often scantily, with rather coarse red roots, fine hair-like fibres, black fungal hyphae, fine black fern stems and leaf stalks, placed in bush, briars, weeds, clump of creepers or ferns, base of frond in spiny rattan (*Calamus*) or fan palm, 0.5–1.8 m above ground, possibly sometimes on ground; of 17 active nests in Thailand, 15 were in rattan palm and two in small unidentified saplings. Clutch 2–5 eggs, mostly 3, whitish or pale pinkish-white to bright salmon, sparingly marked with spots, blotches and squiggles of reddish-brown or brown and ink-purple or lavender; incubation period 14–15 days; nestling period 11 days; post-fledging dependence period 7–9 weeks; second brood begun before previous one finally disperses, male adult then caring for previous brood and female attempting to provision nestlings alone. Occasional brood parasitism by Violet Cuckoo (*Chrysococcyx xanthorhynchus*) reported. Nest predation main cause of failure in one study in Thailand.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common in much of its range in appropriate habitat, and common in parts of SE Asian range. Very rare and local in Nepal except in far E, where common. Rare resident in lower foothills in Bhutan, having been fairly common near Gelephu in 1967 before forest there cleared. Locally common in India, where common in Nameri and Kaziranga National Parks (Assam), and elsewhere in NE India present in e.g. Buxa Tiger Reserve (West Bengal), with 5 birds/km<sup>2</sup> in semi-evergreen forest and 9–7 birds/km<sup>2</sup> in mixed plantation and natural forest, also in Balphakram National Park (Meghalaya) and Ngengpui Wildlife Sanctuary (Mizoram). Common in Sundarbans East Wildlife Sanctuary, in Bangladesh, but otherwise very local in that country. Fairly common in Thailand, with 13 pairs in 30 ha of forest plot in Khao Yai National Park. Fairly common (at least before 1970) in Cambodia. In Laos, common in Phou Xang He National Biodiversity Conservation Area (NCBA), occasional in Xe Pian NBCA and Dong Hua Sao NBCA, and present in Phou Xiang Thong NBCA. In Vietnam, present in four protected areas in the Annamese lowlands, and common in Bach Ma National Park and fairly common in Nam Bai Cat Tien National Park. Common in Taman Negara National Park, in Peninsular Malaysia. Local in Borneo, where up to 1994 only 21 documented records could be found; rare in Sabah, but present in Similajau and Bako National Parks and Semenggo Forest Reserve, in Sarawak, and Tanjung Puting National Park (common in nipa), in S Kalimantan, and common in scrub in grassland N of Banjarmasin. Present in Gunung Leuser and Way Kambas National Parks, in Sumatra, rare in latter, but common around Bagansiapiapi (on N coast); very common in the now destroyed Padang-Sugihan Wildlife Reserve, in S Sumatra.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Birand & Pawar (2004), Buij *et al.* (2006), Chasen (1939), Chasen & Kloss (1930), Dasgupta (1976), David & Gosselin (2002a), David-Beaulieu (1944), Deignan (1963), Delacour & Jabouille (1931a), Duckworth *et al.* (1997), Eames *et al.* (2001), Evans *et al.* (2000), Godwin-Austen (1870), Grimmett *et al.* (1998), Holmes (1996, 1997), Hopwood (1919), Hume (1880), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Khan (2005), Lekagul & Round (1991), MacKinnon (1988), van Marle & Voous (1988), Medway & Wells (1976), Mees (1971), Nash, A.D. & Nash (1985a, 1985b), Nash, S.V. & Nash (1985a, 1985b, 1987a, 1988), Oates (1883), Parrott & Andrew (1996), Pierce *et al.* (2004), Rasmussen & Anderson (2005), Robinson (1928), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Round (1998), Sheldon *et al.* (2001), Singh (1995), Sivakumar *et al.* (2006), Smythies (1986), Smythies & Davison (1999), Spierenburg (2005), Stevens (1914, 1923), Thewlis *et al.* (1996), Thomas & Poole (2003), Timmins & Wilkinson (1996), Wickham (1929), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991), Witt & Sheldon (1994).

## 128. Horsfield's Babbler

### *Malacocincla sepiaria*

**French:** Akalat de Horsfield **German:** Horsfieldmaustimalie **Spanish:** Tordina de Horsfield  
**Other common names:** Horsfield's Jungle Babbler, Rusty-brown Babbler; Koengke/Vanderbilt's Babbler ("vanderbilti")

**Taxonomy.** *Brachypteryx sepiaria* Horsfield, 1821, Bogor, Java.

Previously thought to be conspecific with *M. perspicillata*. Form described from Aceh (N Sumatra) as "*M. vanderbilti*" now known to be synonym of race *barussana* of present species. Proposed race *liberalis* (NW Sumatra) merged with *barussana*, and *minor* (E Java and Bali) with nominate. Five subspecies recognized.

**Subspecies and Distribution.**

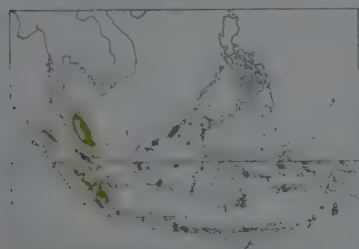
*M. s. tardinata* E. J. O. Hartert, 1915 extreme S Thailand and Peninsular Malaysia.

*M. s. barussana* Robinson & Kloss, 1921 – Sumatra.

*M. s. harterti* Chasen & Kloss, 1929 – N Borneo.

*M. s. rufiventris* Salvadori, 1874 – S Borneo.

*M. s. sepiaria* (Horsfield, 1821) – Java and Bali.



**Descriptive notes.** 15–16 cm; 25–33 g. Nominative race has crown dark brown, noticeably darker and greyer than olive-brown upperparts, upwelling and short tail; lores and supercilium pale grey, ear-coverts and neck side slightly streaky buff-brown; chin, submoustachial area and throat whitish, lower throat and upper breast with vague greyish-buff streaks, breast and upper flanks greyish-buff, shading to whitish on belly and buffy ochre on lower flanks, thighs and vent; iris red to brown; upper mandible blackish-horn, lower mandible yellowish-grey; legs grey to fleshy-purple. Differs from very similar *M. abbotti* in

being shorter-tailed, darker above, especially on crown (which lacks pale streaks), and in having streaks on upper breast. Sexes similar. Juvenile has upperparts rather more rufous than adult. Race *tardinata* has brighter ochraceous flanks and vent than nominate, extending over lower belly; *barussana* is generally darker than nominate, with distinctly greyer throat and upper breast, flanks dark ochre; *rufiventris* is richer and slatier above, more obviously streaked throat and upper breast, ochraceous-grey breastband, and much richer and more extensive buff-ochre on lower underparts;

*harterti* is like last, but underparts rather less richly coloured, crown and nape on average slightly less grey. Voice. Usual song a strident, clearly spaced "wi-cho-teu" or "tip-top-tiu", first note high and sharp, second short and lowest, third high and shrill; variations occur, particularly when excited, and first note sometimes omitted. Song in Java a plodding, unevenly spaced, often 4-note series, with longer, rising end note, "wip-chup-chu-puiii" or "chip-wip-chu-puiii", sometimes a 3-note "wip-pip-pui" or "wip-chup-puiii". Call a harsh explosive "whit-whit-whit...", interspersed with quieter "wer" notes.

**Habitat.** Broadleaf evergreen forest, usually bordering streams or near water (described once as preferring dark places shaded by tangles of big looping lianas on valley slopes in hilly forest, but better evidence of such choice needed); also logged and old secondary forest, *Albizia* and *Gmelina*. Lowlands to 700 m in Thailand and Peninsular Malaysia, 300–1400 m in Sumatra, generally up to 1700 m in Borneo and Java.

**Food and Feeding.** Insects, including small locustids, beetles (Coleoptera, including weevils), butterflies and their pupae (Lepidoptera), ants (Formicidae) and grubs. Forages on ground and in low vegetation, sometimes in middle storey up to 15 m; often works its way up large creeper-covered trees. Found singly, in pairs or in small parties.

**Breeding.** Apr–May in Peninsular Malaysia, Feb–May (but apparently all months except Jul) in Java, and Feb–Sept and Nov in Borneo. Nest a broad, rather slight, untidy cup, made of dead (sometimes large) leaves, lined with fine black rootlets, fine twigs and fine fibres, placed up to 1 m above ground in sapling or more concealed site. Clutch 2 eggs, reportedly pink with reddish squiggles in Java. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare in Thailand. Fairly common to common in Peninsular Malaysia, where common in Taman Negara National Park. Locally common in lowland forested areas of Borneo; common in Sabah, including Danum Valley Conservation Area; present in Similajau National Park (Sarawak), Gunung Palung National Park (W Kalimantan), Kayan Mentarang National Park (E Kalimantan), and common but perhaps local in Tanjung Puting National Park (S Kalimantan). Present in Gunung Leuser National Park, in Sumatra. Common in Gunung Gede-Pangrango National Park and present in Ujung Kulon National Park, in W Java; recorded in more than 30% of surveys at two localities inside Alas Purwo National Park, in E Java. **Bibliography.** Andrew (1985), Buij *et al.* (2006), Chasen (1939), Chasen & Hoogerwerf (1941), Chasen & Kloss (1930), David & Gosselin (2002a), Deignan (1963), Duckworth *et al.* (1997), Grantham (2000), Holmes (1997), Hoogerwerf (1950a, 1966, 1971), Lekagul & Round (1991), MacKinnon (1988), van Marle & Voous (1988), Medway & Wells (1976), Mees (1995), Meyer de Schauensee & Ripley (1940b), Nash & Nash (1988), O'Brien & Kinnaird (1996), Robinson (1928), Robinson & Kloss (1924b), Robson (2000), Sheldon *et al.* (2001), Smythies & Davison (1999), Sody (1956), Thompson (1966), Voous (1948), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## 129. Black-browed Babbler

### *Malacocincla perspicillata*

**French:** Akalat à sourcils noirs

**German:** Schwarzbrauen-Maustimalie

**Spanish:** Tordina Cejinegra

**Taxonomy.** [*Cacopitta*] *perspicillata* Bonaparte, 1850, Java; error = Borneo.

Previously thought to be a local race of *M. sepiaria* or to be conspecific with equally enigmatic (and now discredited) "*M. vanderbilti*", but now considered a valid species. Monotypic.

**Distribution.** S Borneo.



**Descriptive notes.** c. 15–16 cm. Has drab brown crown, broad brownish-black supercilium from above bill to side of nape, crown shading to vague dull greyish-brown on nape, this in turn shading to dull rufous-brown on upperparts, upwelling and tail; feathers of rump and lower flanks copious and fluffy; lores whitish with blackish area in front of eye, cheek and ear-coverts slightly brown-stained pale grey, latter with whitish shaft streaks, apparently a whitish eyering at least on lower half of eye; chin and throat whitish, shading to pale grey on cheek and breast, with narrow whitish streaks on grey breast, belly shading from pale

grey to dull rufous-brown on flanks, lower belly and undertail, central belly mixed with some mid-grey; iris colour not known; bill rather long and strong, with clear hook, blackish-brown basally and along culmen, becoming paler distally; legs dull brownish. Sexes presumably similar. Juvenile unknown. Voice. No information.

**Habitat.** Probably lowland forest of some type.

**Food and Feeding.** No information; diet presumably small invertebrates and some vegetable matter. Relatively short tarsi of the only specimen suggest that it may be more arboreal than are its congeners.

**Breeding.** No information.

**Movements.** Presumed resident.

**Status and Conservation.** VULNERABLE. Often reckoned to be extinct. Restricted-range species: responsible for defining Kalimantan Lowlands Secondary Area. Known from a single specimen of uncertain provenance, but most likely collected around Martapura (or possibly Banjarmasin), in S Kalimantan, between 1843 and 1848. Numbers likely to have declined in recent decades as a result of extensive forest destruction in the region; all original lowland habitat around Martapura has disappeared. Pleihari Martapura Nature Reserve, although now consisting of severely degraded hilly forest, is supposed to cover 300 km<sup>2</sup> at 200–1170 m elevation, and is probably the best place to search for this species.

**Bibliography.** Anon. (2006d), Bonaparte (1850), Butchart & Stattersfield (2004), Collier *et al.* (2001), Hoogerwerf (1966), MacKinnon & Phillips (1993), Mees (1995), Smythies & Davison (1999), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 130. Short-tailed Babbler

### *Malacocincla malaccensis*

**French:** Akalat à queue courte

**German:** Kurzschwanz-Maustimalie

**Spanish:** Tordina Colicorta

**Taxonomy.** [*Brachypteryx*], *malaccensis* Hartlaub, 1844, Malacca, Peninsular Malaysia.

Has been placed in genus *Trichostoma*. Forms a superspecies with *M. cinerea*; may perhaps be conspecific, but song very different. Populations in parts of Borneo have been regarded as

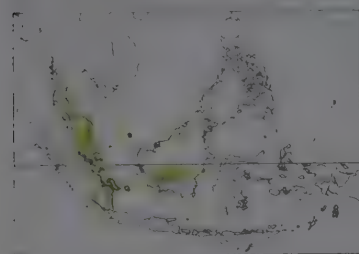


subspecifically distinct, but variation slight and probably clinal; proposed races *sordida* (NE Borneo) and *samurai* (Bangka, Belitung, and W. Borneo) both considered synonymous with *poliogenys*. Proposed race *feriata* (from Mt Mulu, in NW Borneo), based on single specimen, has characters apparently exhibited by juveniles of this species. Two subspecies recognized.

#### Subspecies and Distribution.

*M. m. malaccensis* (Hartlaub, 1844) – S Thailand, Peninsular Malaysia, Singapore, Sumatra and its islands, Anambas Is and Natuna Is.

*M. m. poliogenys* (Strickland, 1849) – Bangka, Belitung and Borneo.



**Descriptive notes.** 13.5–14.5 cm; 18.5–28 g. Like a small version of *M. abbotti*, but with very short (often cocked) tail, thinner bill, greyish ear-coverts and blackish moustachial stripe against strong white throat. Nominative race has crown dark ochrous-brown, nape, mantle and back slightly paler, shading to slightly rufescent rump, with brown upwringing and very short tail fringed chestnut; face (lores, supercilium, ear-coverts and neck side) dull grey, slightly darker under eye, where merges into dark grey or blackish moustachial stripe; chin, submoustachial area and throat to lower belly silky white, breast side to lower flanks pale

warm buff, vague pale warm buff wash across breast; iris red to brown; upper mandible blackish, lower mandible often paler; legs usually flesh-coloured or pinkish, sometimes grey. Sexes similar. Juvenile has paler brown cap, head side tinged brown, rusty outer fringes of primaries, ochrous-buff throat. Race *poliogenys* has slightly more rufescent crown than nominate, slightly less rufescent wing fringes, rump and tail, more slaty-grey wash on upperparts, and much stronger and darker warm buffy breast wash and flanks. **Voice.** Song a series of 6–7 loud rich whistled notes, descending in pitch, introduced by dry trill, “pi’pi’pi’pi’pi’pew pew pew pew pew”; reportedly given as duet by pair-members, with very high level of co-ordination, but single birds respond to tape playback and give entire song alone. In Sumatra, reported duet initiated by female with barely audible downslurred whistle, short pause, then sequence of 6 downslurred and progressively longer notes, immediately picked up and repeated by male. Calls with low, harsh, crackling, rattling sounds and a harsh, mechanical “chututututut...”, interspersed with soft “yer” notes; also “fit-zweet” and “fit-fit-zweet”, and rapidly repeated “pew”.

**Habitat.** Primary broadleaf evergreen forest and secondary growth, drier parts of peatswamp-forest, stream edges, scrub, thickets, older *Albizia* plantations adjacent to forest, overgrown rubber, sapling bamboo thickets; kerangas pole forest at Similajau National Park (NW Borneo). To 1000 m.

**Food and Feeding.** Insects, including black beetles (Coleoptera), small grasshoppers (Orthoptera) and ants (Formicidae). Usually forages just above or on ground, singly or more usually in pairs.

**Breeding.** Feb–Sept throughout range, but in Borneo also birds in breeding condition in Nov and nestling in Jan; possibly multi-brooded. Nest a neat cup, sometimes semi-roofed with large dead leaves, made of fine twigs, root fibres or leaves, lined with grass-like material or fine roots and tendrils, placed up to 0.3 m above ground among fallen twigs or small saplings, or on ground and concealed by small saplings between buttresses of tree or inside large curled-up dead leaf. Clutch 2–3 eggs, pale creamy buff to pinkish-red with spots, streaks or squiggles of rich brown to reddish and sometimes pale mauve. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Fairly common to common in continental range. Common in Taman Negara National Park, in Peninsular Malaysia. Locally common in Borneo, and common in Danum Valley Conservation Area (Sabah); fairly frequent in Berau district forest (E Kalimantan); present in Similajau National Park (Sarawak) and common in Tanjung Puting National Park (S Kalimantan). Present in Gunung Leuser and Way Kambas National Parks, in Sumatra, frequent in latter; recorded from the now destroyed Padang-

Sugihan Wildlife Reserve, in S Sumatra. A Sundic lowland-forest species, thus highly susceptible to the extensive forest destruction throughout its range, although ability to survive in second growth and hill-slope forest implies that it is not immediately at risk.

**Bibliography.** Anon. (2004), Bai *et al.* (2006), Borenart & Stattersfield (2004), Chavén (1939), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth & Keish (1988), Duckworth *et al.* (1997), Eames (2005), Hartert (1895), bin Jalan & Galdikas (1987), Johns (1989), Lekagul & Round (1991), Löffing (1984), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Nash, S.V. & Nash (1985a, 1987c, 1988), Oberholser (1932), O’Brien & Kinnaird (1996), Parrot & Andrew (1996), Rajathurai (1996), Robinson (1927), Robson (2000), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Thompson (1966), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

## 131. Ashy-crowned Babbler

### *Malacocincla cinereiceps*

**French:** Akalat à tête cendrée **German:** Graukopf-Maustimalie **Spanish:** Tordina Coronigris  
**Other common names:** Ashy-headed Babbler

**Taxonomy.** *Drymocapthus cinereiceps* Tweeddale, 1878, Puerto Princesa, Palawan, W Philippines. Has been placed in genus *Trichostoma*. Forms a superspecies with *M. malaccensis*; may perhaps be conspecific, but song very different. Monotypic.

**Distribution.** Palawan and Balabac, in W Philippine Is.



**Descriptive notes.** 13 cm; 22–26 g. Has crown to nape dull darkish grey, upperparts, upperwing and tail dull rufous-tinged ochrous-brown; lores, cheek and ear-coverts pale grey, moustachial streak as crown; chin, submoustachial area and underparts white, except for pale brownish-ochre narrow breastband and breast side, flanks, thighs and vent; iris brown to chestnut; upper mandible blackish-grey, lower mandible pearly pinkish; legs pearly pinkish. Differs from very similar *M. malaccensis* in colours of crown, hindneck and upperparts, much paler grey ear-coverts and cheek, rendering dark moustachial stripe more

obvious, and buff of underparts discoloured to brownish-ochre. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a series of 4–9 husky, stressed, forced, nasal “jheuw”, “chieuw” or “jheuw” notes, e.g. “jhieu-jhieu-jhieu-jhieu...”, sometimes with 1–4 brief weak stuttering introductory notes; song lasts 3–5 seconds, repeated after c. 8 seconds.

**Habitat.** Primary and secondary broadleaf evergreen forest, second growth and scrub, to 1300 m. **Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Found singly or in pairs, foraging near or on ground, behaving very much as *M. malaccensis*. Inquisitive, responding to “pishing”; flicks wings lightly when on the move.

**Breeding.** Apr–Sept. Nest described as a cup, made of grasses, rattan fibres and dead bamboo leaves, lined with mosses and lichens, placed on ground at base of rattan. Clutch 2 eggs, off-white and covered with red/brown spots (more numerous at broader end), or blue and thickly speckled with dark brown. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Palawan EBA. Fairly common.

**Bibliography.** Delacour & Mayr (1946), Dickinson *et al.* (1991), Hachisuka (1935), Hartley & McGowan (1991), Kennedy *et al.* (2000), McGregor (1909), duPont (1971), Stattersfield *et al.* (1998), Whitehead (1890).





132



ssp. celebensis

133



ssp. fuscus

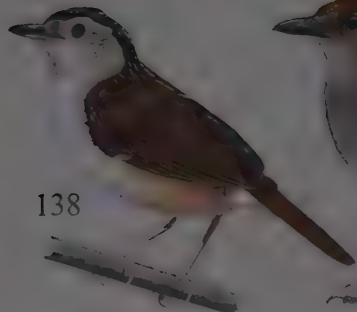
134



135



138



136



137



ssp. mindanensis

139



ssp. minuta

140



141



142



143



ssp. lepidopleurus

ssp. macrodactylus

ssp. annamensis

146



typical morph

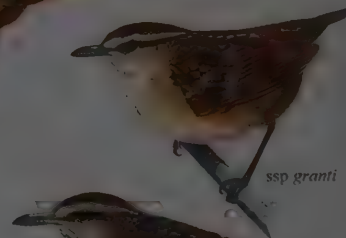
ssp. crispifrons

white-throated morph

ssp. calcicola

ssp. granti

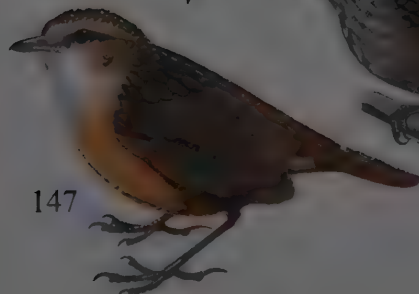
149



ssp. guttaticollis

ssp. epilepidota

147



ssp. stevensi

148



ssp. leucosticta

ssp. brevicaudata



# Genus *TRICHASTOMA* Blyth, 1842

## 132. White-chested Babbler

### *Trichastoma rostratum*

**French:** Akalat à front noir **German:** Mangrovemaustimalie **Spanish:** Tordina Pechiblanca  
**Other common names:** Blyth's (Jungle) Babbler, Mangrove Babbler

**Taxonomy.** *Trichastoma* [sic] *rostratum* Blyth, 1842, Singapore.  
Two subspecies recognized.

#### Subspecies and Distribution.

*T. r. rostratum* Blyth, 1842 – extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, Singapore, Sumatra (including Riau Archipelago and Lingga Archipelago) and Belitung.  
*T. r. macropteron* (Salvadori, 1868) – Borneo, including Banggai I.



**Descriptive notes.** 15 cm; 20.5–23 g. Smallish babbler, brown above and white below, with rather long narrow hook-tipped bill and shortish tail. Nominate race has crown brown with slightest greyish tinge, upperparts brown with slightest rufescent tinge, upperwing and tail with dull rufous-chestnut fringes; face (lores, supercilium, ear-coverts, cheek) buffy brown, chin and submoustachial area to vent silky white with soft grey breast side and flanks, lower flanks with buffy tinge; iris brown; bill black above, horn below; legs pale flesh or greyish-brown. Sexes similar. Juvenile is similar to adult. Race *macropteron* has

mantle to rump slightly more olive-tinged, less rufescent, than nominate. **Voice.** Song a repeated, quite high-pitched, clear “wi-ti-tiu”, “chui-chwi-chew” or “chwi-chi-chee”, sometimes introduced with short trill, “chr chr ooi-uee”; at least seven distinct variations (seemingly common to all individual singers) in Sumatra, involving 3–5 notes, with first note either a harsh whistle or a short buzz and last note either rising or falling in pitch. Female may give loud “teew” with sharp falling inflection every 0.6 seconds, 2–4 times, during male song. Calls with harsh, scolding rattles.

**Habitat.** Riverine broadleaf evergreen forest and secondary growth, lightly logged forest, mangroves, upland heath and peatswamp-forest, coastal habitat on (larger) offshore islands, beach-stand scrub, abandoned old rubber plantations, older *Albizia* plantations, low bushes of streambanks and damp valley bottoms, usually near water; regarded as a forest-riverbank specialist, and often seen (from canoes) by streambanks in upper reaches of rivers. To 200 m.

**Food and Feeding.** Grubs and insects. Usually in pairs. Forages on ground, hopping about rocks, trunks, branches and roots at water's edge; also sallying after insects.

**Breeding.** Mar–Jun in SE Asia. Nest, built by both sexes over 18 days or more, a loose deep cup made of dead leaves, which may be collected from pond when wet (birds have been observed apparently wetting lining materials before adding them to nest), and strips of dried palm fronds, roughly lined with fine fibres and rootlets, placed 0.4–1.2 m above ground in base of ground palm or hidden in small rattan. Clutch 2 eggs, pale greenish, spotted and blotched with dark greenish-brown. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Generally fairly common to common in continental part of range, but now rare in Singapore; common in Taman Negara National Park and Kuala Selangor National Park, in Peninsular Malaysia. Locally common throughout lowland mixed dipterocarp forest in Borneo, and judged common in Sabah, including Danum Valley Conservation Area; frequent in Berau district forest (E Kalimantan) and rather common in Barito swamp region (S Kalimantan); present in Similajau National Park (Sarawak), and common in Tanjung Puting National Park (S Kalimantan). Uncommon in Sumatra, where present in Gunung Leuser, Bukit Tigapuluh (locally very common) and Way Kambas (scarce) National Parks; recorded from the now destroyed Padang-Sugihan Wildlife Reserve, in S Sumatra. A Sundaic lowland-forest species, thus highly susceptible to the extensive forest destruction throughout its range, although ability to survive in second growth and overgrown plantations implies that it is not immediately at risk.

**Bibliography.** Anon. (2006d), van Balen & Prentice (1997), Bransbury *et al.* (1994), Buij *et al.* (2006), Burchard & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Duckworth & Kelsh (1988), Duckworth *et al.* (1997), Eames (2005), Holmes (1997), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1970, 1976), Nash, S.V. & Nash (1985a, 1987b, 1988), Parrott & Andrew (1996), Rajathurai (1996), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Stattersfield & Capper (2000), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## 133. Sulawesi Babbler

### *Trichastoma celebensis*

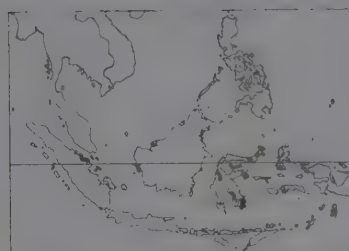
**French:** Akalat des Célèbes **German:** Weißkehl-Maustimalie **Spanish:** Tordina de Célebes  
**Other common names:** Celebes/Strickland's Babbler

**Taxonomy.** *Trichastoma* [sic] *celebensis* Strickland, 1849, Sulawesi.

Geographical variation partly clinal; proposed races *connectens*, from NC Sulawesi, and *improbatum* (of which *sordidum* is a synonym), from SE, considered to represent part of this cline, and therefore merged with *rufoscapulum*. Four subspecies recognized.

#### Subspecies and Distribution.

*T. c. celebensis* Strickland, 1849 – N Sulawesi (including islands of Manterawu, Bangka and Lembeh).  
*T. c. togianense* (Voous, 1952) – Togian Is (N Sulawesi).  
*T. c. rufoscapulum* (Stresemann, 1931) – C & SE Sulawesi, including Butung I.  
*T. c. finschi* Walden, 1876 – SW Sulawesi.



**Descriptive notes.** 15–5 cm. Smallish, relatively featureless babbler with strong bill and thin malar whisker, strikingly but mostly clinally varied in coloration. Nominate race has crown, nape and neck side dusky dark brown, upperparts slightly paler, upperwing and tail strongly fringed chestnut; lores, ear-coverts and cheek dusky ash-brown, ear-coverts with very fine buff shaft streaks, malar line darker, dusky grey; chin and throat silky white, breast (and especially breast side) soft grey, middle to lower belly silky white, flanks, thighs and vent pale brownish-ochre; iris brown; upper mandible black, lower mandible grey to pale grey; legs

pale grey-brown to brown. Sexes similar. Juvenile is like adult, possibly more saturated above and on lower flanks, but situation uncertain (report of dusky spotting on chest mistaken). Race *rufoscapulum* has pale brownish-ochre on malar line, breast and breast side; *togianense* is whiter below, breast, flanks and vent with slight warm buff wash; *finschi* lacks chestnut in wings and tail, and has entire underside ochrous-buff, palest on chin and throat and on mid-belly, darkest and brown-tinged on sides. **Voice.** Main song consists of short variable phrases of liquid fluty melancholy whistles, including “duwi’ wuwu’ wuei” (0.8 seconds), “tuwe-wi” (0.4 seconds), “tuu-tleé-pu-wiu” (1 second), in each phrase first note usually descending and last note upslurred; sometimes presumed female duets by answering phrases with insistent, high-pitched, nasal downslurred whistle, “kiew, kiew, kiew...”, given 2–10 times at 2 notes per second. Call by singing bird in excitement a bubbling “wuwuwuwuweweei”; female has continuous twittering “tededu tededu tededu...” during courtship display; rapid scolding “kshkshkshkshksh...”, varying in pitch and tempo; also heard.

**Habitat.** Primary broadleaf evergreen forest, selectively logged and disturbed primary forest, forest on ultrabasic rock, secondary woodland, wooded savanna, forest edge, scrub, thickets, coconut groves, cultivated areas with settlements, and sago swamps; lowlands to 1900 m, but perhaps mainly below 1000 m. In one study, most abundant in forest gardens and next most numerous in logged forest and natural forest, but abundance greater in more forested area overall than in more deforested one.

**Food and Feeding.** Presumably invertebrates. Forages close to or on ground, with mouse-like runs, on fallen trees and in dense scrub; has been observed also to call from canopy, at c. 13 m. **Shy.**  
**Breeding.** Apr–Dec. Nest a cup of dead leaves and grass blades, placed 0.3–0.5 m above ground. Clutch 2 eggs, greenish-white with reddish markings, likened to those of Spotted Flycatcher (*Muscicapa striata*). No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common and widespread, especially at lower elevations. Very common in all habitats at Gunung Ambang Nature Reserve, commonly heard (if rarely seen) in Manembonembo Nature Reserve and present in Panua Nature Reserve, in N Sulawesi; common in Bogani Nani Wartabone (Dumoga Bone) National Park, in N Sulawesi, common, at least locally, in Lore Lindu National Park, in C Sulawesi, and present in Rawa Aopa Watumohai National Park, in SE Sulawesi.

**Bibliography.** Bororing *et al.* (2000), Coates & Bishop (1997), Holmes & Wood (1980), Indrawan *et al.* (2006), Riley & Mole (2001), Riley *et al.* (2003), Rozendaal & Dekker (1989), Stresemann & Heinrich (1940b), Waltert *et al.* (2005), Wardill *et al.* (1999), White & Bruce (1986).

## 134. Ferruginous Babbler

### *Trichastoma bicolor*

**French:** Akalat ferrugineux **German:** Weißwangen-Maustimalie **Spanish:** Tordina Bicolor

**Taxonomy.** *Brachypteryx bicolor* Lesson, 1839, Sumatra.

Monotypic.

**Distribution.** Extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, Sumatra and Borneo.



**Descriptive notes.** 16.5–18 cm. Smallish babbler, rufous-brown above and creamy below, with brighter rufous tail and rather long hook-tipped bill. Crown is pale dull rufous, with greyish-buff lores and vague supercilium, buffy-brown ear-coverts; mantle to rump and upperwing-coverts dull rufous-brown, wing fringed dull rufous, tail brighter rufous; underparts buffy whitish or creamy white, breast with slightly darker shading, somewhat variable individually; iris pale brown, sometimes reddish-brown, rarely red; upper mandible pale brown, lower mandible paler, flesh or greyish, sometimes slightly yellow at base; legs flesh-

brown. Sexes similar. Juvenile is brighter and warmer above than adult, with mantle and crown almost as bright as tail. **Voice.** Sings with repeated loud, clear, rather sharp “u-wit” or “u-wee” (second note higher); also variable low jolly phrases, e.g. “wit wi-ti-tu-tu”. Calls are low, harsh, dry, rasping sounds and sharp, explosive “wit” notes.

**Habitat.** Closed-canopy lowland evergreen mixed dipterocarp forest, selectively logged forest, upland heath forest, old rubber plantations, older *Albizia* plantations adjacent to forest, scrub left by shifting agriculture; also swamp-forest and locally in mangroves in Sumatra; commonest in primary forest in Sumatra. Below 700 m in SE Asia; below 600 m in Sumatra, above 920 m in Borneo (Sarawak).

**Food and Feeding.** Ants (Formicidae) and other insects. Found in pairs or in small loose parties of 4–5 individuals. Usually in lower to middle storey of forest; general foraging height 1–2.5 m, sometimes up to 10 m. Forages mainly by gleaning foliage.

**Breeding.** Apr–Jul in SE Asia and Feb–Sept in N Borneo (Sabah). Nest described as a small untidy open cup, made externally of dead bamboo or other leaves, internally of strips of palm leaves, dead

On following pages: 135. Bagobo Babbler (*Leonardina woodi*); 136. Rusty-headed Babbler (*Rohsonius rabori*); 137. Grey-banded Babbler (*Rohsonius sorsogonensis*); 138. Striped Wren-babbler (*Kenopia striata*); 139. Streaked Ground-babbler (*Ptilocheila mindanensis*); 140. Palawan Ground-babbler (*Ptilocheila falcata*); 141. Bornean Ground-babbler (*Ptilocheila leucogrammica*); 142. Marbled Wren-babbler (*Turdinus marmoratus*); 143. Large Wren-babbler (*Turdinus macrodactylus*); 144. Black-throated Wren-babbler (*Turdinus atrigularis*); 145. Rusty-breasted Wren-babbler (*Turdinus rufipectus*); 146. Limestone Wren-babbler (*Gypsophila crispifrons*); 147. Mountain Wren-babbler (*Napothera crassa*); 148. Streaked Wren-babbler (*Napothera brevicaudata*); 149. Eyebrowed Wren-babbler (*Napothera epilepidota*).



leaf stalks and fine twigs, placed in depression in bank, rattan, or pandan-like or ginger-like plant, 0.2–0.75 m above ground. Clutch 2 eggs, pale buffish-white with grey and pinkish-grey spots and flecks and chestnut blotches and squiggles, or whitish with reddish-brown mottling, or pink with red-orange spots and marks. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally fairly common to common in continental part of range, including Iaman Negara National Park, in Peninsular Malaysia. Local and moderately common throughout Borneo, and judged common in Sabah, including Danum Valley Conservation Area; present in Similajau National Park (Sarawak), and uncommon in Tanjung Puting National Park (S Kalimantan). Present in Gunung Leuser, Bukit Tigapuluh (common to fairly common) and Way Kambas (frequent) National Parks, in Sumatra; recorded from the now destroyed Padang-Sugihan Wildlife Reserve, in S Sumatra.

**Bibliography.** Ban *et al.* (2006), Chasen (1999), Damersén & Heegaard (1995), Deignan (1963), Duckworth & Kelsch (1988), Duckworth *et al.* (1997), Hume & Davison (1878), Johns (1989), Lamberti (1992), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Nash, S.V. & Nash (1985a, 1988), Oates (1883), O'Brien & Kinnaird (1996), Parrott & Andrew (1996), Robson (2000), Sheldon *et al.* (2001), Smythies (1986), Smythies & Davison (1999), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## Genus *LEONARDINA* Mearns, 1905

### 135. Bagobo Babbler

#### *Leonardina woodi*

**French:** Akalat de Wood    **German:** Mindanaomaustimalie    **Spanish:** Tordina de Mindanao

**Taxonomy.** *Leonardina woodi* Mearns, 1905, Todaya, 4000 feet [c. 1220 m], Mount Apo, Mindanao, Philippines.

Original genus name *Leonardia*, but that name was invalid, as preoccupied. Genus often merged with *Trichastoma* or with *Malacocincla*, but differs from both in its longer tarsus, shorter toes, rounded (rather than oval) nostril, thinner bill, proportionately longer tail, and very different song. Specimen from Mt Puting Bato (E Mindanao) distinctive, and likely to be described as a race. Currently treated as monotypic.

**Distribution.** Mindanao, in S Philippine Is.



**Descriptive notes.** 20 cm. Medium-sized, highly secretive ground-dwelling babbler, dark brown above and grey below, with white throat, long graduated tail, rather long legs. Crown and upperparts are dark chestnut-brown, feathers of rump long and soft with concealed white spots, upperwing and tail with slight rufescent wash; lores, cheek and ear-coverts grey, dark moustachial line passing under ear-coverts to neck side, submoustachial area grey and adjoining grey of underparts, except for white chin and throat and ochre-tinged flanks (some flank feathers having concealed white spots), olive-brown vent; iris reddish-brown; bill

black; legs blue-grey. Sexes similar. Juvenile apparently undescribed. **VOICE.** Song an extremely high-pitched, insect-like tinkling, reportedly in series of 4 or more notes, "seeeeeep seep seep", repeated every 4–5 seconds, but can be more or less continuous strophe, without obvious pauses, consisting of many more elided notes.

**Habitat.** Primary broadleaf evergreen and montane evergreen forest and edge, ridgetop forest and transition (lowland–montane) forest, at 500–2030 m.

**Food and Feeding.** Invertebrates, although specimens have been snared in rat traps baited with meat. Stays close to or on forest floor, hopping and walking.

**Breeding.** Birds in breeding condition in Feb, Apr and May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Formerly considered Vulnerable. Originally assumed to be very rare, but is mainly just elusive. Fieldwork involving snap-traps for small ground mammals and mist-nets for birds has yielded evidence that this species is common in areas surveyed; is therefore probably common on all higher mountains of Mindanao.

**Bibliography.** Delacour & Mayr (1946), Dickinson *et al.* (1991), Hachisuka (1934, 1835), Kennedy *et al.* (2000), McGregor (1909), Mearns (1905), duPont (1971), Rand (1950), Salomonsen (1952), Scharringa & Wassink (1990), *Fieldiana* (1909).

## Genus *ROBSONIUS* Collar, 2006

### 136. Rusty-headed Babbler

#### *Robsonius rabori*

**French:** Turdinule de Luzon    **German:** Rostgesichtimalie    **Spanish:** Ratina de Rabor  
**Other common names:** Rabor's/Rusty-faced/Luzon Wren-babbler

**Taxonomy.** *Napothera rabori* Rand, 1960, Tabbug, Pagudpud, Ilocos Norte, Luzon, Philippines. Previously placed in genus *Napothera*. Formerly regarded as conspecific with *R. sorsogonensis*. Monotypic.

**Distribution.** NE Luzon, in Philippine Is.

**Descriptive notes.** 20–22 cm; 48 g. Rather long-billed and long-legged ground-haunting babbler, brownish above with dull rusty-chestnut head, grey below with black markings and white streaks, and bold white spots on wings. Crown is rusty rufous with narrow black scales, shading to rufescent-olive upperparts with larger blackish scaling; plainer and rustier on very fluffily lower upperparts



brown, vent dark rufescent brown; iris hazel to brown; upper mandible dark horn-brown, lower mandible greyish-pearl; legs pearly brownish-horn. Sexes similar. Juvenile is dull chestnut-brown above, with two rows of pale wing spots, dull rufous-chestnut supercilium and ear-coverts, dull greyish-chestnut below, pale greyish-brown throat and continuous white margin to elongate flank feathering. **VOICE.** Song a variable, extremely high, wispy, slurred, insect-like "tsui-tsui-sui" or "tsui-tsui-sui-ee", rising at end, lasting 1.7–1.9 seconds, and repeated every 7–9 seconds (or less when excited); similar version also given with short introductory note, "tit-tsui-tsui-sui-ee", lasting 2.2–2.5 seconds, or sometimes "twit-tweet" or "tsui-tsui-sui-sui". Calls as yet undescribed.

**Habitat.** Lowland forest and second growth, from sea-level to 1000 m; one juvenile found by small pool in meadow near edge of secondary forest.

**Food and Feeding.** No information on diet; presumably invertebrates. Walks slowly across forest floor; also hops, and often cocks tail. Flips over leaves and wood debris in search of food.

**Breeding.** Juveniles in May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *R. sorsogonensis* listed as Near-threatened; formerly considered Vulnerable. Restricted-range species: present in Luzon EBA. Status difficult to determine owing to secretive habits. Considered uncommon. Tape playback indicates that it is more common than is implied by the rate at which it is encountered in the field. Forest destruction within its elevational range extensive, however, and populations must be declining and disappearing. Present in the Northern Sierra Madre Natural Park.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Dickinson *et al.* (1991), Goodman & Gonzales (1990), Kennedy *et al.* (2000), duPont (1971), Poulsen (1995), Rand (1960), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

### 137. Grey-banded Babbler

#### *Robsonius sorsogonensis*

**French:** Turdinule du Sorsogon    **German:** Braungesichtimalie    **Spanish:** Ratina de Rand  
**Other common names:** Luzon/Sorsogon Wren-babbler

**Taxonomy.** *Napothera sorsogonensis* Rand and Rabor, 1967, Mount Bulusan, San Roque, Bulusan, Sorsogon Province, southern Luzon, Philippines.

Previously placed in genus *Napothera*. Formerly regarded as conspecific with *R. rabori*. Two subspecies recognized.

**Subspecies and Distribution.**

*R. s. mesoluzonicus* duPont, 1971 – C Luzon, in N Philippine Is.

*R. s. sorsogonensis* Rand & Rabor, 1967 – S Luzon and Catanduanes.



**Descriptive notes.** 20–22 cm; 57–65 g. Nominate race has forehead greyish-olive, shading on crown to olive, all with faint dark scales; mantle and upper back olive with faint narrow dark scales, becoming uniform brown on lower back, paler on rump, where white tips of feathers form semi-concealed bar, uppertail-coverts dark rufescent brown, tail dark brown; greater and median upperwing-coverts black, broadly fringed brown and tipped white, rest of upperwing-coverts greyish olive-brown, a few near bend of wing tipped white, primary coverts black with white tips, flight-feathers broadly edged brown, with bold white tips on

outer two and indistinct tip on third; lores and narrow supercilium to above eye white, cheek and ear-coverts grey, finely streaked white, submoustachial stripe white, narrow malar streak blackish; chin to upper breast white, neck and breast sides and middle to lower breast grey, belly white, long fluffy feathering on flanks dull rusty brown, undertail-coverts dark red-brown; iris brown; bill blackish-brown, basal half of lower mandible grey; legs light brown. Differs from similar *R. rabori* in having crown much less rusty, head side greyish with white flecks, chin to upper breast white, grey breastband shading to white belly, much less dark scaling above. Sexes similar. Juvenile has buffier throat and cheeks with less obvious dark tips on submoustachial area, weakly developed grey breastband, all-chestnut belly and flanks, obscured (grey-buff) tips of wing-coverts and outer primaries, pale lower mandible. Race *mesoluzonicus* has crown, hindneck and upperparts more rufescent and with somewhat bolder black feather margins than nominate, grey breastband broader, flanks darker. **VOICE.** Song a very high, thin, high-pitched "tit-tsui-tsui-sui-sui" (third and fourth notes higher, fourth rising towards end), also "tsui-tsui-sui-sui", "tsui-tsui-sui-sui", "tsui-tsui-sui-sui" or "tit-tsui-sui-sui", lasting 1.2–1.9 seconds and repeated every 2–7 seconds; similar in pitch and quality to that of *R. rabori*, but apparently somewhat shorter and simpler in structure. Calls as yet undescribed.

**Habitat.** Broadleaf evergreen forest, forest edge, secondary growth, vicinity of limestone rocks and outcrops, among bamboo and moss-covered rocks and boulders; lowlands to 1000 m.

**Food and Feeding.** Stomach of one specimen held insects; presumably many types of invertebrate taken. Forages on ground, walking slowly across forest floor, also hops; fans and cocks tail often at 30°, exceptionally higher (60°). Searches for food items by flipping over leaves and wood debris.

**Breeding.** Feb–Aug. Nest a large ball with large front entrance, placed 0.6–0.75 m above ground in rattan, resembles that of a pitta (*Pitta*). Clutch 2 eggs, white with reddish-brown speckles; nestlings fed by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. When treated as conspecific with *R. rabori* listed as Near-threatened; formerly considered Vulnerable. Restricted-range species: present in Luzon EBA. Sta-



tus difficult to determine owing to secretive habits. Considered uncommon. As with *R. rabori*, numbers may be higher than is suggested by field observations, although habitat loss within its range has been, and continues to be, extensive. Present in Quezon and Mount Isarog National Parks.

**Bibliography.** Collar (2006, 2007), Collar *et al.* (2001), Dickinson *et al.* (1991), Harrap & Mitchell (1994), Kennedy *et al.* (2000), Lambert (1993), duPont (1971), Rand & Rabor (1967), de Roever (1990).

## Genus *KENOPIA* G. R. Gray, 1869

### 138. Striped Wren-babbler

#### *Kenopia striata*

**French:** Turdinule striée

**German:** Goldzügelimalie

**Spanish:** Ratina Estriada

**Taxonomy.** *Timalia*, *striata* Blyth, 1842, "Singapore".  
Monotypic.

**Distribution.** Thailand, Peninsular Malaysia, Sumatra and Borneo.



**Descriptive notes.** 14–15 cm; 17–22 g. Bold-patterned small babbler with distinctive white face and underparts, and white streaks on brown mantle and neck. Crown and nape are black, with broad white streaks on central crown to nape, upperparts chestnut-brown, with broad white streaks on mantle and on slightly blackish neck side, smaller streaks on upperwing-coverts and back, with upperwing and tail rufescent brown; bristly erect loral feathers orange-buff, ear-coverts smudgy greyish, rest of face (supercilium, area around eye, cheek and submoustachial area) white and continuous with white of underparts, but breast

side scaled black and flanks streaked dull buffy ochre; iris brown to blackish; bill black to blue-black, base of lower mandible flesh-coloured; legs pale flesh. Sexes similar. Juvenile has crown brownish with narrow buffy-white streaks, reduced upperpart streaking, no neck-side streaking or breast-side scaling. **Voice.** Song a short clear monotone whistle, "chuiii", repeated every 1.5–2 seconds, with initial stutter; sometimes "chuiuu" or "chi-uuu", with very short space between notes. Calls include soft "pee-pee-pee", soft frog-like "churrh-churrh-churrh" and, when agitated, short twangy nasal notes.

**Habitat.** Broadleaf evergreen forest, lightly logged forest and upland heath forest; swampy areas reportedly favoured, but evidence needed. Up to 750 m in SE Asia, and to 200 m, locally 1500 m, in Sumatra; mostly to 610 m in Borneo, with single records from 1050 m and 1220 m.

**Food and Feeding.** Small thin insects reported. Usually singly or in pairs, sometimes in small parties. A terrestrial substrate-gleaner, foraging on or close to ground, among leaf litter, fallen logs etc.; some foliage-gleaning has apparently also been observed.

**Breeding.** May–Oct in SE Asia; bird in breeding condition in Feb and dependent young in May in N Borneo (Sabah). Nest an open cup, mainly of dead leaves, lined simply with blackish root-like material, placed up to 1 m above ground in palm-like understorey plant. Clutch 2 eggs, whitish, strongly but rather sparsely marked primarily with rufous-brown to reddish-brown spots and blotches. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Generally uncommon, occurring at fairly low density. Fairly common in Taman Negara National Park, in Peninsular Malaysia. Frequent in Borneo, although reportedly uncommon in Sabah, where fairly common in Danum Valley Conservation Area; relatively infrequent in Berau district forest (E Kalimantan), and present in Similajau National Park (Sarawak) and Kayan Mentarang National Park (E Kalimantan). Occurs in Gunung Leuser, Bukit Tigapuluh and Way Kambas (scarce) National Parks, in Sumatra. As a Sundanic lowland-forest species, it is highly susceptible to extensive forest destruction throughout its range, although its ability to survive in hill-slope and logged forest implies that it is not immediately at risk. Numbers decline, however, in response to fragmentation and logging of lowland-forest habitat.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Danielsen & Heegaard (1995), Duckworth & Kelsch (1988), Duckworth *et al.* (1997), Eames (2005), Gore (1968), Holmes (1996, 1997), Johns (1989), Lambert & Collar (2002), Lekagul & Round (1991), van Marle & Voous (1988), Medway & Wells (1976), Parrott & Andrew (1996), Robson (2000), Sharpe (1889), Sheldon *et al.* (2001), Stattersfield & Capper (2000), Thompson (1966), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991).

## Genus *PTILOCICHLA* Sharpe, 1877

### 139. Streaked Ground-babbler

#### *Ptilocichla mindanensis*

**French:** Turdinule des Philippines

**Spanish:** Ratina de Mindanao

**German:** Philippinenwollimalie

**Other common names:** Streaked/Striated Wren-babbler; Mindanao Ground-babbler (*mindanensis*)

**Taxonomy.** *Ptilopygia mindanensis* A. W. H. Blasius, 1890, Mindanao, Philippines.

Four subspecies recognized.

**Subspecies and Distribution.**

*P. m. minuta* Bourns & Worcester, 1894 – Samar and Leyte, in EC Philippine Is.

*P. m. fortichi* Rand & Rabor, 1957 – Bohol, in SC Philippines.

*P. m. mindanensis* (A. W. H. Blasius, 1890) – Mindanao, in S Philippines.

*P. m. basilanica* Steere, 1890 – Basilan, off W Mindanao.



**Descriptive notes.** 13–14 cm; 26–31 g. Distinctive smallish short-tailed ground-dwelling babbler, dark brown with white throat, long white stripes below. Nominative race has crown blackish-edged rufescent brown with pale shaft streaks, upperparts dull rufescent brown with vague pale shaft streaks, rump plain and more chestnut, upperwing and tail plain brown with slight rufescent tinge; lores whitish, bold white postocular supercilium, ear-coverts greyish-brown, submoustachial stripe black; chin and throat white, underparts dull ochrous-brown with long broad white stripes, narrower and fewer stripes on lower areas; iris variable, orange

to dark brown; bill blackish, paler base of lower mandible; legs brown to dark brown. Sexes similar. Juvenile apparently undescribed. Race *minuta* is smaller than nominate, with darker brown upperparts, bolder shaft streaks on back, and slightly darker breast; *fortichi* is like previous, but margins of crown and back feathers black, lower back and rump darker, and greater contrast between blackish-brown and white on underparts; *basilanica* has pale chestnut-brown upperparts with pale shaft streaks. **Voice.** Song on Bohol a spaced 8-note series, descending in pitch, with stressed notes, "hi hi hi hi hi 'hu hi hi hiéw", reminiscent of that of a *Cacomantis* cuckoo; on Mindanao song similar, "hi hi hi 'uu uu uu uu-u", with second song type consisting of 4–12 clear penetrating "hiúú" or "jhiéw" whistles, first syllable stressed but quieter, "hiúú-hiúú-hiúú-hiúú...", both types being recorded simultaneously. In alarm, calls with short spluttering notes stressed at start, "trrr'lt", "trrr'lt", "wh'rrp" and similar.

**Habitat.** Primary and logged forest; generally below 1000 m, but to 1400 m on Mt Kitanglad (Mindanao).

**Food and Feeding.** Presumably invertebrates. Found singly, in pairs or in small parties of up to four individuals. Forages in dense low vegetation near ground, or while walking on ground; turns over leaves.

**Breeding.** Jan–Aug. One nest was a small semi-domed cup, made of dead leaves, loosely lined with roots and small plant twigs, 0.3 m above ground and wedged among leaf-stalk bases of small spiny palm; contained 1 egg, bluish-tinged white, with mid-brown blotches and lines and underlying pale purple-brown clouds. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Mindanao and the Eastern Visayas EBA. Considered to be generally uncommon in most of range, though fairly common in Rajah Sikatuna National Park, on Bohol. Previously classified as Near-threatened.

**Bibliography.** Blasius (1890b), Brooks *et al.* (1996), Delacour & Mayr (1946), Dickinson *et al.* (1991), Hachisuka (1935), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1897), duPont (1971), Rand & Rabor (1957, 1960), Robson & Davidson (1996), Stattersfield *et al.* (1998).

### 140. Palawan Ground-babbler

#### *Ptilocichla falcata*

**French:** Turdinule de Palawan

**German:** Palawanwollimalie

**Spanish:** Ratina de Palawan

**Other common names:** Falcated Ground-babbler/Wren-babbler/Babbler

**Taxonomy.** *Ptilocichla falcata* Sharpe, 1877, Puerto Princesa, Palawan, Philippines.  
Monotypic.

**Distribution.** Palawan and reportedly also Balabac, in W Philippines.



**Descriptive notes.** 19–20 cm. Medium-sized ground-babbler covered in remarkable long black-and-white stripes, with rusty patches on head; bill rather long and straight with hooked tip, tail proportionately longer than that of congeners. Body plumage above and below is loose and elongate, black with long whitish stripes; wing and tail mid-brown with chestnut wash, crown and hindneck chestnut-brown, forehead, frontal lores, supercilium and neck side light chestnut, basal lores and ear-coverts dark brown, broad submoustachial stripe white, narrow malar stripe blackish, chin and throat white; iris hazel to dark brown; bill

rather long and straight with hooked tip, blackish with dull horn base to lower mandible; legs dark brown to horn-brown. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a loud, mournful, undulating, variable whistled couplet, not unlike that of *Napothera*, monotonously repeated, e.g. "hiuuu-huu'oo" (first note generally rising, second descending slightly), "hiuii-huu'oo", "huuii-hee'oo'oh" and the like, occasionally with single part of couplet only; also jumbled chattering versions when excited.

**Habitat.** Primary broadleaf evergreen forest, often in vicinity of streams, gulleys and ridgetops, also in bamboo forest at two sites; apparently not present in logged or secondary forest. Lowlands to at least 800 m.

**Food and Feeding.** Scorpions found in stomach of one specimen; insects and berries also recorded. Forages secretively on or near ground; walks, hops and scrambles around dense thickets and fallen trees.

**Breeding.** Jan; two birds with weakly developed gonads in Oct and Nov. Probably present on territory all year. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species; present in Palawan EBA. Known from only ten sites on Palawan, of which only four involve post-1980 records. Formerly considered fairly common and even, at one site, abundant, but in recent years appears to have declined both in density and in number of locations. Logging of lowland forest evidently incompatible with this species' survival, and very little intact habitat now remains on the island. Present in St Paul's Subterranean River National Park, and also benefits from some protection in Iwahig Penal Colony. Formerly categorized as Endangered.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Dickinson *et al.* (1991), Hachisuka (1935), Kennedy *et al.* (2000), Lamberti (1993), McGregor (1909), duPont (1971), Sharpe (1877b), Sison (1983), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Whitehead (1890).



## 141. Bornean Ground-babbler

*Ptilocichla leucogrammica*

French: Turdinule de Bornéo German: Borneowollimalie Spanish: Ratina de Borneo  
Other common names: Bornean Wren-babbler

**Taxonomy.** [*Cacopitta*] *leucogrammica* Bonaparte, 1850, Pontianak, south-west Borneo. Monotypic.

**Distribution.** Borneo.



**Descriptive notes.** 15–16 cm; 37–42 g. Crown is dull olive-brown with vague blackish scaling, upperparts uniform chestnut-brown, more intensely chestnut on upperwing and very fluffy rump, tail blackish-chestnut; head side mottled and streaked; chin, submoustachial area and throat whitish with tiny black tips, with broken black malar line, breast to belly black with broad white round-ended stripes, all shading to dull ochreous-chestnut on lower flanks, thighs and vent; iris dark brown; upper mandible black, lower mandible pale grey; legs grey. Differs from similar *P. mindanensis* in larger size, much longer bill and neck, more

contrasting dark cap, more chestnut upperparts, shorter white stripes on black underparts. Sexes similar. Juvenile is less rufescent above than adult, crown lightly streaked. **Voice.** Song consists of 2 mournful, pure-tone whistles given reportedly in antiphonal duet by territorial pair from perch near ground, “doo-dee” or “doo-doo-dee”. Call a spluttering “churr” or “prrr”.

**Habitat.** Primary, secondary and sometimes recently logged lowland broadleaf evergreen dipterocarp forest, peatswamp-forest dominated by *Shorea alba*, and upland heath forest, at 40–600 m; recorded once in seven-year-old *Albizia* plantation. Found especially in gulleys and along dry creeks. Almost certainly intolerant of serious habitat degradation, as densities greatly reduced in logged forest compared with primary forest.

**Food and Feeding.** Small insects found in two stomachs. Forages in pairs and family parties on forest floor and among herb layer; probes under leaves, on dead logs and among rotting treefalls.

**Breeding.** Feb–Sept; birds in breeding condition in Jul, Aug and Oct in N Borneo (Sabah). Territories apparently held all year. Clutch 2 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Rare and local. Highly sensitive to forest disturbance by logging, and disappears completely with forest clearance. Destruction and degradation of lowland forest in Borneo have led to loss of almost all primary areas in the past several decades; of 40 known sites for this species, only nine involve post-1980 records. This species is perhaps particularly disadvantaged because it is probably little able to disperse through inappropriate habitat, leading to highly isolated populations. Known from Danum Valley Conservation Area and Tabun Wildlife Reserve, in Sabah; Gunung Mulu, Batang Ai and Similajau National Parks and Samunsam Reserve, in Sarawak; Ulu Temburong National Park, in Brunei; and Kayan Mentarang, Kutai and Gunung Palung National Parks, in Kalimantan.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Duckworth & Kelsh (1988), Duckworth *et al.* (1997), Gönner (2000), Gore (1968), Holmes (1997), Lambert (1992, 1993), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Thompson (1966), Voous (1961), Wells *et al.* (1978), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991).

Genus *TURDINUS* Blyth, 1844

## 142. Marbled Wren-babbler

*Turdinus marmoratus*

French: Turdinule marbrée German: Marmortimalie Spanish: Ratina Jaspeada

**Taxonomy.** *Turdinus marmoratus* R. G. W. Ramsay, 1880, Padang Highlands, western Sumatra. Genus commonly merged into *Napothera*. Two subspecies recognized.

**Subspecies and Distribution.**

*T. m. grandior* Voous, 1949 – Peninsular Malaysia.

*T. m. marmoratus* R. G. W. Ramsay, 1880 – Sumatra.



**Descriptive notes.** 21–5 cm. Large, sturdy babbler with prominent scaling above and below. Has crown to back deep warm brown with blackish scaling, rump plainer, more chestnut-tinged and very fluffy, upperwing and tail dull rufescent brown; lores whitish, face (supercilium, cheek, ear-coverts) and neck side chestnut, chin and throat white, black scaling on lower throat; submoustachial area black with white flecks, adjoining black breast to belly with narrow white scaling, all becoming dull ochreous-chestnut on lower flanks, thighs and vent; iris chestnut; bill black; legs black, often with brownish tinge. Sexes similar. Juvenile

has rufous shaft streaks on head and mantle, broadening towards tips, underparts dark brownish-grey with slight rufous tips becoming buffier on belly, so that scaled pattern very indistinct. Race *grandior* is slightly larger than nominate. **Voice.** Sings with clear double or single whistle, “puuu-chiiiii”, “pyuuu-chiiiii” or “puuii-jhiiii”, with higher, somewhat rising first note and lower, buzzy second note, like *T. macrodactylus*. Also “puuu-chiiiii” and “uuuu-jhi” or single “puuii”.

**Habitat.** Lower montane broadleaf evergreen forest, at 610–1220 m in Peninsular Malaysia, 1000–2000 m in W Sumatra.

**Food and Feeding.** Insects, including beetles (Coleoptera) and grubs; sometimes fallen berries and small fruits. Forages on or near ground, in undergrowth, often in damp areas. Very shy and secretive.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Rare and local in Peninsular Malaysia. Present in Gunung Leuser and Kerinci Seblat National Parks, in Sumatra. Formerly considered Near-threatened.

**Bibliography.** Buij *et al.* (2006), Glenister (1951), Holmes (1996), MacKinnon & Philipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Robinson (1928), Robinson & Kloss (1919b), Robson (2000), Stattersfield *et al.* (1998), Voous (1949).

## 143. Large Wren-babbler

*Turdinus macrodactylus*

French: Grande Turdinule German: Graubauchtimalie Spanish: Ratina Grande  
Other common names: Large-footed Wren-babbler

**Taxonomy.** *Malacopteron macrodactylum* Strickland, 1844, Malacca, Peninsular Malaysia.

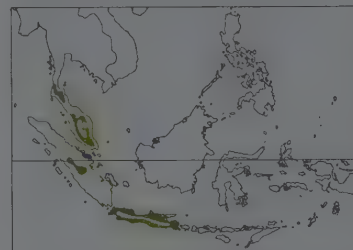
Genus commonly merged into *Napothera*. Has been thought to form a superspecies with *T. atrigularis* and *T. rufipectus*. Three subspecies recognized.

**Subspecies and Distribution.**

*T. m. macrodactylus* (Strickland, 1844) – S Thailand and Peninsular Malaysia.

*T. m. beauforti* Voous, 1949 – Sumatra

*T. m. lepidopleurus* (Bonaparte, 1850) – Java.



**Descriptive notes.** 19 cm; 52–58 g. Fairly large, streaky brown babbler with white throat and greyish underparts. Nominative race has crown to back streaked light brown and black, becoming slightly paler, plainer, more rufescent brown on fluffy rump and uppertail-coverts; upperwing and tail brown, former fringed pale brown; lores whitish, with dense dark grey speckling on lower portion, greyish-blue bare skin around eye, more extensive behind eye, separated from crown by black line, ear-coverts blackish-brown, submoustachial area speckled whitish and brown; chin, throat and upper breast off-white with some brown flecking, bordered below by scrappy blackish-brown breastband (variable in strength and width), lower breast to belly brownish-grey with vague broad buffy-white streaks, more ochreous on flanks and tinged cinnamon on thighs and vent; iris brown; bill blackish-horn; legs brownish. Sexes similar. Juvenile has upperparts and wings paler and more rufous than adult, darker crown and ear-coverts, pale buff shaft streaks (but no pronounced dark scaling) on upperparts, rather uniform below, slightly rufescent, pale drab brown, with whiter throat and belly centre and indistinct darker breast markings. Race *beauforti* has less developed breastband than nominate, upperparts generally darker; *lepidopleurus* is notably darker above, with almost no breastband, darker grey mid-belly, browner flanks and vent. **Voice.** Song very variable. Usually consists of short loud clear whistled phrases, repeated every few seconds, e.g. “chuu-chreeh” or “chu-chiii”, or descending and then rising “phuu-wiii” or “u-wiii”; also, single “chuuu”, sometimes combined with coarser notes as e.g. “uuu-chorii” or “chuuu weeah-weeah”. May give longer series of rather slow notes, e.g. “wii-tu-tu-tu-tu” (first note higher) and “pu-chuu-chuu-chuu-chuu”. During duets, slow “pu-yu-yu...” is answered by “chuuu” or “chuuu-chii”. Longer song variants include “uuu-wi-wi-wi-wi-wriiu” (mid-section faster) and “pi-pi-pi-pi-pi-peeoo”, with slower last note.

**Habitat.** Broadleaf evergreen forest, selectively logged forest, bamboo forest, “rubber jungle”; favours thickets of rattan, salak palm, bamboo and gingers. Usually below 200 m in Thailand, but to 700 m in SE Asia generally; locally to 900 m in Java.

**Food and Feeding.** Invertebrates. Found singly, in pairs or small parties. Forages on or close to ground (but sings from higher perches, up to c. 5 m or more). Turns over leaves on ground in manner of a pitta (*Pitta*).

**Breeding.** Dec–Jul in SE Asia and Mar and Sept in W Java. Nest a large cup made of dead leaves, lined with thin layer of twigs, roots and hair, often surrounded by more leaves, placed 0.4–1 m above ground in middle of rattan, pandan or crown of spiny palm. Clutch 2 eggs, pale pinkish-white to pinkish-red with diffuse dark reddish-pink lines and spots, or red squiggly lines, or few scattered small dark reddish blotches. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Uncommon to fairly common in S Thailand and Peninsular Malaysia; extinct in Singapore. A Sundic lowland-forest species, thus highly susceptible to the extensive forest destruction throughout its range, although use of submontane forest implies that it is not immediately at risk. Numbers decline in response to fragmentation and logging of lowland-forest habitat. Fairly common in Khao Pra-Bang Kham Wildlife Sanctuary, in Thailand, and common in Taman Negara National Park, in Peninsular Malaysia. Present in Gunung Leuser and Bukit Tigapuluh National Parks, in Sumatra. Present in Ujung Kulon National Park, in W Java, and Alas Purwo and Baluran National Parks, in E Java. An unconfirmed record from Bali.

**Bibliography.** Anon. (2006d), Buij *et al.* (2006), Butchart & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Danielsen & Heegaard (1995), Deignan (1963), Grantham (2000), Holmes (1996), Hoogerwerf (1971), Johns (1989), Lambert & Collar (2002), Lekagul & Round (1991), MacKinnon (1988), van Marle & Voous (1988), Medway & Wells (1976), O’Brien & Kinnaird (1996), Robson (2000), Sody (1956), Stattersfield & Capper (2000), Voous (1949).

## 144. Black-throated Wren-babbler

*Turdinus atrigularis*

French: Turdinule à gorge noire German: Fahlbauchtimalie Spanish: Ratina Golinegra

**Taxonomy.** [*Cacopitta*] *atrigularis* Bonaparte, 1850, Borneo.

Genus commonly merged into *Napothera*. Has been thought to form a superspecies with *T. macrodactylus* and *T. rufipectus*. Monotypic.

**Distribution.** Borneo.

**Descriptive notes.** 18 cm; 61–71.5 g. Fairly large, dark, streaky babbler, with black face, throat and breast. Crown is dull buffy brown with narrow black scaling, upperparts brighter warm buffy ochre with heavy black streaking, uppertail-coverts dull rusty, upperwing and tail dark brown, former with paler and more rusty-brown tinges; lores and submoustachial stripe pale buff, ear-coverts, chin, submoustachial area, throat and upper breast black, mid-breast to belly pale buff with black scales, latter fading on plain buff lower belly, and becoming bright rusty on lower flanks; thighs and vent; iris





reddish-brown to dark brown, bare skin behind eye pale blue; bill black, lower mandible grey, or horn at base; legs horn to dull pinkish-brown. Sexes similar. Juvenile more reddish-brown above, rusty buff below, with heavy blackish streaking and scaling on throat, breast and flanks. Voice. Song, in duet by pair, a series of 8–10 long, loud, plaintive, slightly downslurred whistles, also a long series of up to 42 clear bell-like notes, starting more slowly, then delivered quite quickly, notes including “iuuh”, “iiew”, “iyuh” and “yuuh”, e.g. “iiew iiew iiew-iiew-iiew-iiew-iiew-iiew-iiew-iiew-iiew-iiew...”. In duet, one bird gives a series of this song type while other

adds slightly descending “iuuh-iuh-iuh... iuuh-uh-uh”. Calls include “we-ah, we-ah, we-ah”, very deep and gruff, recalling *Kenopia striata*, and (possibly the same) a rather nasal, coarse “krav, krav”. **Habitat.** Mainly primary lowland broadleaf evergreen forest, especially on river terraces, old secondary forest, logged forest (where much rarer), but extends into montane forest; generally in lowlands and lower slopes to 500 m, with individual records at 1150 m in Sabah and 1220 m in Sarawak. **Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Mainly terrestrial, searching leaf litter and flicking leaves aside with bill; also creeps about beneath tree roots and clings low down to bark of trees, not using tail for support, and investigates crevices by probing with bill. In groups of up to seven individuals.

**Breeding.** Dec–May in Sabah. Probable nest in Nov (Sabah) was a big untidy cup of dead leaves with finer lining, placed less than 0.5 m up in diverging bases of ginger fronds; contained two young. Egg laid during capture was white with rufous splotches. No other information. **Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Uncommon in Sabah, where present in Danum Valley Conservation Area. Forest destruction in the Sundaic lowlands of Indonesian Borneo has been so extensive that it was predicted in 2000 that all primary formations would have disappeared by the year 2010, and situation is little different in Malaysian Borneo; the species’ preference for submontane forests, however, implies that it is not immediately at risk.

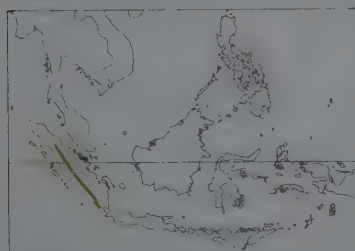
**Bibliography.** Anon. (2006d), Buichart & Stattersfield (2004), Chasen & Kloss (1930), Collar *et al.* (2001), Holmes & Burton (1987), MacKinnon & Philipps (1993), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield & Capper (2000), Voous (1949, 1961).

## 145. Rusty-breasted Wren-babbler

### *Turdinus rufipectus*

**French:** Turdinule de Sumatra **German:** Kastanienbauchtimalie **Spanish:** Ratina Pechirrufa  
**Other common names:** Rufous-chested Wren-babbler, Sumatran (Large) Wren-babbler

**Taxonomy.** *Turdinus rufipectus* Salvadori, 1879, Mount Singgalang, western Sumatra. Genus commonly merged into *Napothera*. Has been thought to form a superspecies with *T. macrodactylus* and *T. atrigularis*. Monotypic. **Distribution.** Sumatra.



**Descriptive notes.** 18–19 cm. Mid-sized babbler, scaled dark brown above, dull rusty with vague dark scales and pale streaks below, throat whitish. Crown, neck side and upperparts are warm buffy brown with broad dark brown scaling, upperwing and tail blackish-brown; most of head side with bluish-grey bare skin, ear-coverts grey-brown with dark brown markings; chin and upper throat whitish with blackish peppering, underparts rusty tan with pale shaft streaks and very narrow brown scaling, buffier on mid-belly and darker, blackish-ochre on lower flanks, thighs and vent; iris red, chestnut, brown or chocolate, bluish-grey orbital

skin (particularly over and behind eye); bill black; legs dark brownish. Sexes similar. Juvenile apparently undescribed. Voice. Song a clear piping “hi-hi-hi-hi-hi-huuh” or “ip’ip’ip’ip’ip’ip’uuuh” (with c, 4–6 short notes), lasting 1.2–1.6 seconds, and repeated every 3–6 seconds. In duet, one bird utters almost continuous “ip’ip’ip’ip’ip’ip’...” while second gives varied, undulating “hu-wip ii”, either slow and spaced or speeded-up to “hu-wip’ee”. Calls apparently undocumented. **Habitat.** Primary montane broadleaf evergreen forest, and dense roadside vegetation in conifer plantations, at 900–2500 m.

**Food and Feeding.** Insects, small snails. Forages on ground among leaf litter, and just above ground level.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Sumatra and Peninsular Malaysia EBA. Locally common throughout mountain ranges of Sumatra, and found to be very common in N, near Brestagi; present in Gunung Leuser and Kerinci Seblat National Parks, and locally common at latter. Apparently a low-density species even in good habitat, and probably one that reacts very unfavourably to habitat modification and fragmentation; consequently, a species that is informally of conservation concern.

**Bibliography.** Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Holmes (1996), MacKinnon & Philipps (1993), van Marle & Voous (1988), Meyer de Schauensee & Ripley (1940a), Robinson & Kloss (1924b), Stattersfield *et al.* (1998), Tobias (1995), Voous (1949).

## Genus GYPSOPHILA Oates, 1883

### 146. Limestone Wren-babbler

#### *Gypsophila crispifrons*

**French:** Turdinule des rochers **German:** Kalksteintimalie **Spanish:** Ratina Roquera

**Taxonomy.** *Turdinus crispifrons* Blyth, 1855, Mulayit Taung Tenasserim, Myanmar. Commonly placed in genus *Napothera*. Three subspecies recognized.

**Subspecies and Distribution.**

*G. c. annamensis* (Delacour & Jabouille, 1928) – S China (S Yunnan), N Laos and N Vietnam (Tonkin, N Annam).

*G. c. crispifrons* (Blyth, 1855) – SE Myanmar (including N Tenasserim) and NW & W Thailand.

*G. c. calcicola* (Deignan, 1939) – SW part of NE Thailand.



**Descriptive notes.** 15–16 cm. Rather long-billed and long-tailed mid-sized, dark greyish-brown babbler with dark scales above, whitish streaky throat and mid-belly. Nominat race has crown to back greyish-tinged dark brown with neat narrow black scaling, fluffy rump greyish dark brown, upperwing and tail dark brown, tiny whitish tips on tertials; lores and supercilium vaguely greyish, ear-coverts grey-streaked dark brown, submoustachial area spotted dark brown and whitish; chin to belly whitish with broad grey-brown streaks, sparse on chin and throat, thick on breast and belly and merging with all grey-brown flanks, thighs

and vent, latter ochrous; ■ white-faced and white-throated morph (or partial albino), with white variable in extent and symmetry, occurs in (at least) Tenasserim; iris reddish-brown; bill dark horn, greyer lower mandible; legs greyish-brown. Sexes similar. Juvenile apparently undescribed. Race *calcicola* has thin pale shaft streaks on upperparts, rufescent-brown underparts; *annamensis* has slightly paler, greyer crown and mantle with white shaft streaks, greyer lower breast and mid-belly. Voice. Song a loud rapid faltering series of unevenly pitched harsh slurred notes, starting very abruptly, roughly “chitu-wi-witchuwitchiwitchiwitchiwitchiwitchiu” or slower “titu-titu-titu-titu-titu...”; bouts last 4–30 seconds and are usually repeated after long intervals. Alarm calls are harsh, scolding rattles, “chrrr-chrrr-chrrr...” and “chrrrrow-chrrrrow...”, etc.

**Habitat.** Evergreen and mixed deciduous forest and scrub in limestone hill country, usually with boulders and steep crags in shady, moist areas. At up to 2135 m in Myanmar, below 915 m in Thailand and SE Asia generally, and 300–400 m in Vietnam; below 915 m in China.

**Food and Feeding.** Insects and seeds. Found in pairs or in small parties of up to six individuals (possibly family parties), moving around rocks and tangled vegetation. In Laos, seen to forage around small temple by limestone cliff, entering porches and seemingly indifferent to close passage of monks; yet can be secretive.

**Breeding.** Aug–Sept. Nest a roofed cup or dome with circular entrance, made of dried twigs, roots and other plant material, neatly woven, lined with fine plant material, placed in rock crevice, in one case 10 m from base of outcrop. Clutch 2–5 eggs, white, mottled and spotted purplish-brown, reddish-brown, blackish and mauve. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally locally common across range. Local and uncommon in China. Seemingly much rarer than its habitat in Laos, with very few records. Present in Ba Be National Park and common in Cuc Phuong National Park, in Vietnam.

**Bibliography.** Cheng Tsohsin (1987), David-Beaulieu (1944), Deignan (1963), Delacour (1929), Delacour & Jabouille (1931a), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Eames *et al.* (2001), Hill (2000), Hume & Davison (1878), Lekagul & Round (1991), Meyer de Schauensee (1984), Robson (2000), Robson *et al.* (1989), Smythies (1986), Williamson (1945).

## Genus NAPOTHERA G. R. Gray, 1842

### 147. Mountain Wren-babbler

#### *Napothera crassa*

**French:** Turdinule des montagnes **German:** Blasskehlimalie **Spanish:** Ratina Montana

**Taxonomy.** *Corythocichla crassa* Sharpe, 1888, Kinabalu, north Borneo.

Has been thought to form a superspecies, and possibly to be conspecific, with *N. brevicaudata*. Monotypic.

**Distribution.** Borneo.



**Descriptive notes.** 14 cm. Pale-streaked dark chunky small babbler with dull white throat and dull rufous belly, bristly forecrown feathers projecting forwards. Has crown to lower back blackish with pale buff shaft streaks and dull ochre inner webs, latter becoming dominant posteriorly; dense, fluffy and elongate rump feathers dark brown, upperwing and tail dark brown; lores and supercilium dull whitish-grey (but dark brown spot in front of eye), extending over pale-streaked brown ear-coverts; dull buffy-grey submoustachial area, vague narrow dark malar line; chin to upper breast whitish, shading through vague pale

grey on mid-breast to greyish-ochre with pale rufous streaking on lower breast and to increasingly browner and darker flanks and dark brown vent; iris reddish-brown to dark brown; upper mandible blackish, lower mandible paler with greyish base; legs horn to dark brown. Sexes similar. Juvenile apparently undescribed. Voice. Song a clear, rather shrill and thin steady piping, e.g. “hi-hi-hi-hi-hi”, “hi-hi-hi-hi-hi” or “hi-hi-hi-hi-hi-hi-hi-hi-hi” (notes 3–5 undulating), lasting 0.9–1 second and repeated every 1–3 seconds; sometimes shortened to 2 notes when excited. In song duet, one bird gives this song type, while other repeatedly utters descending “hii-hii-hii”. Calls with quick, stressed “whit” and “whik” notes, “whit” “chrrh”, etc.

**Habitat.** Broadleaf evergreen forest, reportedly preferring dense dark forest where terrain broken up by steep slopes and rocky ravines, and often in densely vegetated banks and beds of small streams, also forest edge and low bamboo growth; at 900–2900 m.

**Food and Feeding.** Insects, including grasshoppers (Orthoptera), also tiny snails. Found in pairs or in small (usually family) parties of 4–5 individuals, sometimes up to ten. Forages in low vegeta-



tion, but often at some height above ground. Rather skulking, but not shy, and sometimes remarkably tame.

**Breeding** Feb–Aug in Sabah. Nest described as a cup made of grasses, placed in moss-covered bank by forest trail. Clutch 2 eggs, white, blotched and streaked with purplish-red, or reddish-buff with brown blotches. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Bornean Mountains EBA. Uncommon in Sabah, but common in Mount Kinabalu National Park. Common in Gunung Ntut Nature Reserve, in W Kalimantan.

**Bibliography.** Banks (1937a, 1937b), Davison (1992), MacKinnon & Phillips (1993), Priemé & Heegaard (1988), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield *et al.* (1998).

## 148. Streaked Wren-babbler

### *Napothera brevicaudata*

**French:** Turdinule à queue courte **German:** Stutzschwanztimalie **Spanish:** Ratina Colicorta  
**Other common names:** Short-tailed/Streak-throated Wren-babbler

**Taxonomy.** [*Turdinus*], *brevicaudatus* Blyth, 1855, Mulayit Taung, Amherst District, Tenasserim, Myanmar.

Has been thought to form a superspecies, and possibly to be conspecific, with *N. crassa*. Races remarkably diverse within rather narrow phenotypic confines, falling into two geographically unassorted groups, one with dull rufous underparts and clearly marked dark and white throat streaks (nominate, *striata*, *rufiventer*), and the other with browner underparts and less contrasting, vaguer streaks (*stevensi*, *proxima*, *griseigularis*); *leucosticta* notably distinctive. Further investigation of species limits required. Birds in N & E Myanmar and W Yunnan (China) sometimes separated as race *venningi*, supposedly larger and more rufous, but fall within range of variation of nominate. Racial identity of birds in NW Laos uncertain, conditionally included in nominate. Seven subspecies recognized.

**Subspecies and Distribution.**

*N. b. striata* (Walden, 1871) – NE India S of R Brahmaputra (including SE Arunachal Pradesh) and NW Myanmar.

*N. b. brevicaudata* (Blyth, 1855) – S China (W Yunnan), NE, E & SE Myanmar (including N Tenasserim), NW, W & N Thailand, and NW Laos.

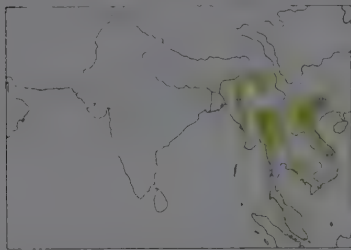
*N. b. stevensi* (Kinnear, 1925) – S China (SE Yunnan E to W Guangxi), NE & C Laos and N Vietnam (Tonkin, N Annam).

*N. b. proxima* Delacour, 1930 – S Laos and C Vietnam (C Annam).

*N. b. griseigularis* (Delacour & Jabouille, 1928) – SE Thailand and SW Cambodia.

*N. b. rufiventer* (Delacour, 1927) – S Annam (Vietnam).

*N. b. leucosticta* (Sharpe, 1887) – S Thailand and Peninsular Malaysia, including Tioman I.



**Descriptive notes.** 12–17 cm. Smallish, rather short-tailed brown babbler with heavy blackish streaking above, dull below with streaked whitish throat and breast. Nominative race has crown and upperparts ochrous-brown, blackish edges of feathers forming broad long black lines, fluffy rump unpatterned dark ochrous-brown, upperwing dark brown with warm olive-brown fringes and tiny whitish tips (wing spots) on some greater coverts and most flight-feathers, tail dark chestnut-brown; face (lores, supercilium, ear-coverts, cheek and submoustachial area) dull greyish with buff and brown mottling; chin to upper breast greyish-white

with thick, soft-edged but neat olive-brown streaks, shading into dull rufous breast side and breast, these shading to streaky dull rufous on lower flanks, belly, thighs and vent; iris red, brown or chocolate-red; bill dark brownish-horn, lower mandible grey; legs dark brown to greyish-flesh. Sexes similar. Juvenile is rather uniform dark brown, with pale shaft streaks on crown to upper back, small dull wing spots, paler chin and throat centre, slightly paler and warmer underparts. Race *striata* is buffier above than nominate, with buff wing spots, slightly duller flanks and vent; *stevensi* is largest, colder dark olive-tinged buff above, colder and darker brown below, with only slight dull rufous edges on central breast and belly, chin and throat almost occluded by longer, broader grey-brown streaks; *proxima* is like previous but smaller, slightly brighter above, paler dull ochrous-buff below; *griseigularis* resembles last, but throat streaks greyer, more diffuse and extending onto whiter breast, with lower belly and vent rusty; *rufiventer* is slightly bigger than nominate, with broader dark edging above, buff wing spots, richer rufous below; *leucosticta* has entire underside broadly streaked dark olive-grey and stony white. Voice. Song consists of very variable, loud, clear, melancholy ringing whistles, repeated after intervals, “chi-oo”, “pee-oo”, “pree”, “chiu-ree”, “chewee-chui” and “pee-wi”, sometimes single “pweeee”. Also as alternating short upslurred “tseurp” and downslurred and then upslurred “tseur” whistles; alternating “tuhhéér, tuhwhit!...”; slow duet of a short, moderately downslurred “tseeur” and lower, moderately upslurred “tsurt”; strongly upturned “fuhwééti” or “fuhwééh”. When alarmed, utters prolonged harsh, buzzy, toneless, scolding “ttrreett” and “chrrreerrrr”, often interspersed with plaintive “wher” notes; other calls include excited, irregular chorus of short quick musical notes at various pitches, a sequence of alternating higher and lower hard staccato notes “chürk-urt-chürk-urt...”, and a hard, rising-and-falling, even-tempo churring trill.

**Habitat.** Broadleaf evergreen forest, often near rocky outcrops; limestone areas outside the range of *Gypsophila crispifrons*, and occasionally alongside latter, e.g. in E Tonkin (N Vietnam). Found at 300–2100 m in India, to 1830 m in SE Asia and China, but only above 610 m in Peninsular Malaysia.

**Food and Feeding.** Insects, grubs and small molluscs. Forages in pairs or small groups on ground, just above ground in dense or tangled vegetation, or around rocks and boulders.

**Breeding.** Jan–Jul. Nest described as an upright dome with entrance near top, a semi-dome or a deep cup made of dead leaves, dead bracken, grasses, rootlets, tendrils, semi-decayed bracken and fern fronds, and moss (materials often in rotten condition; nest can closely resemble a lump of rotting vegetation), lined with dry dead leaves or fine, pale hair-like material, often placed on ground, generally between boulders, but sometimes up to 0.6 m up in hollow in pile of boulders, recess in roadside or trailside bank, wedged in hollow near base of tree, or on mossy bank; often in damp situation, with outside of nest often sodden. Clutch 2–4 eggs (usually 3–4 in India and Myanmar, 2 in Peninsular Malaysia), white with numerous pinkish-red freckles, or with specks and blotches of reddish and pale pinkish-purple, or thinly and unevenly spotted with pale reddish-brown, purple-brown or brownish-mauve; incubation by both sexes; no information on duration of incubation and nestling periods.

**Movements.** Resident. Reports of some seasonal altitudinal movements require substantiation; other evidence suggests completely sedentary.

**Status and Conservation.** Not globally threatened. Generally common across range. Locally fairly common in NE hills of India, where fairly common in Nandapha National Park (Arunachal Pradesh). Local and uncommon in China, where rare in Shiwandashan National Nature Reserve and uncommon in Diding Nature Reserve (Guangxi). Locally common in Myanmar and Thailand. Common in Cardamom Mountains, in Cambodia. In Laos, occasional to frequent in Dong Hua Sao National Biodiversity Conservation Area (NBCA), and common in Nam Kading NBCA, Khammouan Limestone NBCA and part of Nakai-Nam Theun NBCA. In Vietnam, common in Tam Dao National Park but scarce in Cuc Phuong National Park; present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam), and in eight protected areas in the Annamese Lowlands Endemic Bird Area.

**Bibliography.** Ali & Ripley (1948, 1971), Bingham (1903), Cheng Tsohsin (1987), David-Beaulieu (1944), Davidson (1998), Davidson *et al.* (1997), Deignan (1963), Delacour & Jabouille (1931a), Delacour *et al.* (1928), Dickinson (1970), Duckworth *et al.* (1998), Eames (1995), Eames, Eve & Tordoff (2001), Eames, Steinheimer & Ros Bansok (2002), Engelbach (1932), Evans & Timmins (1998), Evans *et al.* (2000), Godwin-Austen (1870), Grimmett *et al.* (1998), Hopwood (1912), Hume (1888), Hume & Davison (1878), Kinnear (1929), Koelz (1954), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Madoc (1956), Madoc & Allen (1952), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Neath (2001), Nguyễn Đức Tu *et al.* (2001), Rasmussen & Anderton (2005), Robbins *et al.* (2006), Robinson (1928), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstenclough *et al.* (1989), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounbolin (1998), Singh (1995), Smith *et al.* (1940, 1943), Smythies (1986), Stanford & Mayr (1941), Stanford & Ticehurst (1930, 1938), Stresemann & Heinrich (1940a), Thewlis *et al.* (1996), Thomas & Poole (2003), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Tordoff *et al.* (2002), Williamson (1945), Zheng Baolai (1988).

## 149. Eyebrowed Wren-babbler

### *Napothera epilepidota*

**French:** Petite Turdinule **German:** Streifenbrusttimalie **Spanish:** Ratina Cejuda  
**Other common names:** Small/Lesser/Streak-breasted Wren-babbler; Austen's Small Wren-babbler (*roberti*); Grant's Wren-babbler (*guttaticollis*)

**Taxonomy.** *Myiothera epilepidota* Temminck, 1828, Java.

Geographical variation considerable. Race *laotiana* often synonymized with *amyae*; birds of latter race from Tonkin (N Vietnam), however, much larger and longer-billed than other races, and further taxonomic investigation therefore required. Birds from SE Laos presumed to be assignable to *laotiana*. Race *bakeri* rather poorly differentiated from *davisoni* and perhaps better merged with it. Proposed race *mendeni* (from S Sumatra highlands) considered a synonym of *diluta*. Thirteen subspecies recognized.

**Subspecies and Distribution.**

*N. e. guttaticollis* (Ogilvie-Grant, 1895) – SE Bhutan and NE India (Arunachal Pradesh, E Assam).

*N. e. roberti* (Godwin-Austen & Walden, 1875) – NE Indian hill states S of R Brahmaputra, and NW Myanmar.

*N. e. bakeri* (Harington, 1913) – E & SE Myanmar.

*N. e. davisoni* (Ogilvie-Grant, 1910) – N & W Thailand and S Myanmar (N Tenasserim).

*N. e. amya* (Kinnear, 1925) – S China (SE Yunnan) and Vietnam (S to C Annam).

*N. e. laotiana* (Delacour, 1926) – N, C & SE Laos.

*N. e. delacouri* Yen Kwokying, 1934 – Yao Shan (EC Guangxi), in S China.

*N. e. hainana* (E. J. O. Hartert, 1910) – Hainan I.

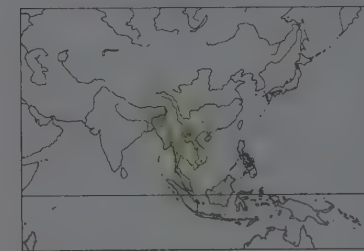
*N. e. clara* (Robinson & Kloss, 1919) – S Annam (Vietnam).

*N. e. granti* (Richmond, 1900) – extreme S Myanmar (extreme S Tenasserim), S Thailand and Peninsular Malaysia.

*N. e. diluta* (Robinson & Kloss, 1916) – Sumatra.

*N. e. exsul* (Sharpe, 1888) – N & C Borneo.

*N. e. epilepidota* (Temminck, 1828) – W & C Java.



**Descriptive notes.** 10–11 cm. Small, streaky, virtually tailless babbler with rather long bill and prominent pale supercilium. Nominative race has crown and upperparts rich chocolate-brown with buff shaft streaks, latter strongest on mantle and back (where black edges also apparent), upperwing and tail brownish-black, upperwing-coverts, tertials and secondaries with vague buffy tips (wing spots); lores blackish, continuing through eye in dark eyestripe, postocular supercilium whitish, ear-coverts dark brown with whitish streaks, submoustachial area dark brown with whitish flecks; chin and throat whitish, breast, belly and upper

flanks dirty ochrous-brown with long whitish streaks, shading on lower flanks, thighs and vent to darker ochrous-brown; iris brown to hazel and red; upper mandible dark horn, lower mandible paler; legs brownish-flesh to horn-brown. Sexes similar. Juvenile is plain brown below, less clearly marked above, wing spots buff. Race *guttaticollis* is paler brown with little pale streaking above, paler grey-brown below, with more whitish streaking on lower underparts, whitish chin and throat with neat, irregular dark brown cone-shaped flecks; *roberti* is like previous, but toned buffy rufous above, below and on head side; *bakeri* is like last below but without the throat markings, and with buffy shaft streaks above; *davisoni* is very like preceding race, but with slight rufescent tinge above; *laotiana* also is similar, but less rufescent below, streaking slightly weaker; *delacouri* resembles previous, but supercilium tinged rufous, crown slightly rufescent; *amyae* is large and long-billed, more slaty brown overall, including ear-coverts, rump feathering copious; *hainana* is smaller than others, with heavier scaling on crown; *clara* is like *davisoni* but slightly colder above, with whiter throat, supercilium and underpart streaking; *granti* has paler centre of breast and belly; *diluta* is like nominate, but with ear-coverts and submoustachial area dark grey and a row of spots running down moustachial line and up behind ear-coverts; *exsul* has buffier throat than nominate, less clearly defined streaks on paler, buffier underparts. Voice. Song a thin clear sad falling whistle, “cheeoo”, “cheeooo” or “pitiii”, repeated at intervals of 2–5 seconds; may be accompanied by 1–2 call notes. When excited, may alternate song phrases with curious, slightly nasal, excited squeaky “chikachik-chikachik-chikachik...”, or “skreeti-skreeti...”. When alarmed, gives fairly subdued but prolonged rattles, e.g. “prrrt-prrrt-prrrt”, “wprrrt wprrrt wprrrt” and “chrrt-chrrt-chrrt”; other calls include loud rising “chyrk!”, often much repeated, and low repeated “pit pit pit”.

**Habitat.** Broadleaf evergreen forest, secondary forest, in Borneo in hilly mixed dipterocarp, damp gallery forest, and *Agathis* conifer forest and bamboo. (Reportedly favours areas with openings for streams or natural small glades, particularly in places strewn with mossy boulders, fallen epiphyte-laden trees, old stumps etc., but this requires substantiation.) Found at 300–1800 m in Indian Subcontinent, and 50–2135 m in SE Asia and China; c. 450–2000 m in Greater Sundas (700–1675 m in Borneo, 900–1800 m in Java).

**Food and Feeding.** Insects, including ants (Formicidae), grasshoppers, locustids and crickets (Orthoptera), and beetles (Coleoptera); also spiders (Araneae). Keeps in pairs or family parties, on forest floor and understorey. Hops among fallen leaves, turning them over to locate food, and creeps about in low undergrowth and tangles.

**Breeding.** Jan–Jun in SE Asia and Indian Subcontinent; Nov–Dec in Java. Nest a dome, semi-dome or cup, made of semi-decayed material (like that of *N. brevicaudata*), usually wedged among boulders, in leaf litter piled against boulder or steep bank, or in grass clump, generally on ground or, less often, slightly (less than 0.3 m) above it. Clutch 2–5 eggs (usually 4 in India and Myanmar, 2 in Peninsular Malaysia and Java), white to greenish-white, sparsely sprinkled with very small rusty to dull brown speckles (Peninsular Malaysia), or pale pinkish, peppered with pink and purple markings (Java); no information on duration of incubation and nestling periods; nestlings fed by both sexes.

**Movements.** Resident. Reportedly subject to seasonal altitudinal movements, wintering down to plains in Himalayas, but this requires substantiation (and contradicted by other evidence).

**Status and Conservation.** Not globally threatened. Generally fairly common to common across range. Rare in Bhutan (apparently one record, in 1936). Rare in India, with very few records. Fairly common but generally overlooked in China, where present in Bawangling National Nature Re-

serve, on Hainan. Present in Kaeng Krachan National Park, in Thailand. In Laos, occasional in Xe Pian National Biodiversity Conservation Area (NBCA), and present in Nam Kading, Nakai-Nam Theun and Hin Namno NBCAs. Fairly common in Cuc Phuong and Tam Dao National Parks, and present in Na Hang Nature Reserve, all in N Vietnam, and occurs in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau, in S Annam); also in eight protected areas in the Annamese Lowlands Endemic Bird Area. In Borneo, scarce in Sabah, and present in Gunung Niut Nature Reserve (W Kalimantan). Present in Gunung Leuser National Park, in Sumatra. Common in Gunung Gede-Pangrango National Park, in W Java.

**Bibliography.** Ali & Ripley (1971), Andrew (1985), Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), David-Beaulieu (1944, 1950), Davidson (1998), Davidson *et al.* (1997), Deignan (1963), Delacour & Jabouille (1931a), Dickinson & Chaiyaphun (1973), Duckworth *et al.* (1998), Eames (1995), Eames *et al.* (2001), Evans & Timmins (1998), Gore (1968), Grimmett *et al.* (1998), Hill (2000), Holmes (1996), Hume (1888), Hume & Davison (1878), King (1983), King & Liao Weiping (1989), Kinnear (1929), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Ludlow & Kinnear (1944), MacKinnon (1988), Madoc (1956), van Marle & Voous (1988), Mayr (1938), Medway & Welik (1976), Meyer de Schauensee (1984), Nguyễn Duc Tu *et al.* (2001), Priemé & Heegaard (1988), Pui Lok *et al.* (2005), Rasmussen & Anderton (2005), Robinson (1928), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Round (1999), Sharpe (1889), Sheldon *et al.* (2001), Showler, Davidson, Chanthaxi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounholine (1998), Singh (1995), Smith *et al.* (1943), Smythies (1986), Smythies & Davison (1999), Sody (1956), Spierenburg (2005), Stevens (1914), Stuart Baker (1893), Thewlis *et al.* (1996), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon, Darjono & Noor (1991), Williamson (1945), Yen Kwokying (1934a).





## Genus *RIMATOR* Blyth, 1847

### 150. Long-billed Wren-babbler

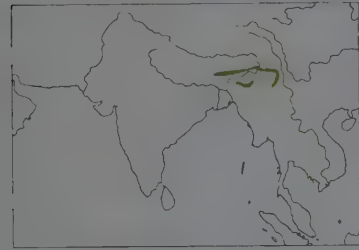
#### *Rimator malacoptilus*

**French:** Turdinule à long bec **German:** Assamzwerigsäbler **Spanish:** Ratina Picuda

**Taxonomy.** *R[imator]. malacoptilus* Blyth, 1847, Darjeeling, India.

Formerly treated as conspecific with *R. pasquieri* and *R. albostratus*. Monotypic.

**Distribution.** Sikkim E to NE India (to Arunachal Pradesh; also, disjunctly to S, from Meghalaya E to Nagaland and N Manipur), N Myanmar and adjacent S China (NW Yunnan).



**Descriptive notes.** 11–12 cm; 18–21 g. Small, almost tailless streaky brown babbler with very long, slightly downcurving bill, blackish moustache. Crown, nape and head side are brown with tiny buff shaft streaks and very narrow black scaling, dorsal feathering long, brown, with long buff shaft streaks, fluffy rump plain and slightly chestnut, upperwing and tail plain brown with rufescent tinge; face (lores, superciliary area, cheek, ear-coverts, submoustachial area) more rufescent, slightly paler brown than crown and with fine buff streaks, moustachial streak and malar stripe dark brown (commonly forming long double line, but variable); chin and throat buff, shading to brown and buff streaking on elongate feathers of breast and flanks, buffier down middle underparts, browner at sides, with rusty-rufous thighs and vent; iris pale red-brown to brown; bill dark horn-brown, paler at tip; legs pale livid-fleshy, tinged brown or pale purplish-horn. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a short (0.4 second) clear whistle, “chiiuh” or “fyeeé”, smoothly falling in pitch but gaining in volume, given every 2–10 seconds; also a similar “féeyew” which begins explosively and only slightly downslurred, quickly becoming much softer and steeply downslurred. When excited, may intersperse song with 1–3 quickly repeated “chip’wu” or “chitt’wu” phrases.

**Habitat.** Broadleaf evergreen forest, forest edge, bamboo, secondary growth, at 900–2000 m, probably rarely to 2700 m.

**Food and Feeding.** Invertebrates. Forages on floor and in undergrowth. Skulking; hops on ground and among low vegetation, rummaging among fallen leaves and mulch, evidently probing into ground (some specimens have had the bill caked with mud). Keeps in pairs.

**Breeding.** May–Jul in India. Nest a rather loose untidy globe with entrance near top, made of leaves, grasses, roots, bracken fronds and weed stems, lined with dead leaves, placed on ground, among a mass of dead leaves at foot of large tree or similar site. Clutch 4 eggs, white with faint lilac or sienna-pink tinge, with small dots and blotches of reddish-brown or purple-brown, and smears of reddish-brown or lilac-grey. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Generally rare or, at least, rarely recorded. Rare in Bhutan; scarce in India, where present in Buxa Tiger Reserve (West Bengal) and Mehao Wildlife Sanctuary and uncommon in Eaglenest Wildlife Sanctuary (both in Arunachal Pradesh). Report from SE Xizang (S China) erroneous.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Choudhury (2000), Collar (2006), Grimmett *et al.* (1998), Han Lianxian (2000), Inskipp & Inskipp (1991), Koelz (1954), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robson (2000), Singh (1995), Smythies (1949, 1986), Spierenburg (2005), Stevens (1914, 1923), Stuart Baker (1901).

### 151. White-throated Wren-babbler

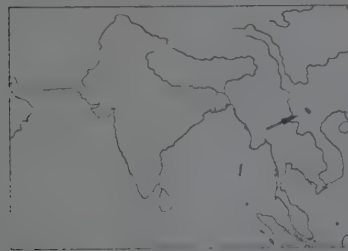
#### *Rimator pasquieri*

**French:** Turdinule de Pasquier **German:** Vietnamzwerigsäbler **Spanish:** Ratina Goliblanca

**Taxonomy.** *Rimator pasquieri* Delacour and Jabouille, 1930, Fan Si Pan [22°17' S 104°47' E], 2500 m, Tonkin, north Vietnam.

Formerly considered conspecific with *R. malacoptilus* and *R. albostratus*. Monotypic.

**Distribution.** Fan Si Pan Mts (W Tonkin), in N Vietnam.



**Descriptive notes.** 11–12 cm. Small, almost tailless streaky brown babbler with very long, slightly downcurving bill, prominent white throat. Crown, nape and head side are darkish rufescent brown with vague buff shaft streaks, dorsal feathering long, darkish brown and with long buff shaft streaks, becoming vague on fluffy dark rufescent rump, upperwing and tail plain darkish rufescent-brown; face (lores, superciliary area, cheek, ear-coverts) slightly paler, plainer brown than crown, submoustachial streak dark brown; chin, malar area and throat pure white, with clear-cut horizontal break to darkish ochre-tinged brown underparts; long whitish-buff shaft streaks on elongate feathers of breast and flanks, buffier down middle underparts, browner at sides, with dark brown thighs and vent; iris brown; upper mandible blackish, lower mandible greyish; legs brown. Differs from similar *R. malacoptilus* in having clean white chin and throat, including malar area and area under short submoustachial stripe, plain mouse-brown ear-coverts, whiter centres of long feathers of underparts, dark brown thighs and vent, and

parts: long whitish-buff shaft streaks on elongate feathers of breast and flanks, buffier down middle underparts, browner at sides, with dark brown thighs and vent; iris brown; upper mandible blackish, lower mandible greyish; legs brown. Differs from similar *R. malacoptilus* in having clean white chin and throat, including malar area and area under short submoustachial stripe, plain mouse-brown ear-coverts, whiter centres of long feathers of underparts, dark brown thighs and vent, and

slightly longer bill and legs. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a whistled “chiiuh” or “tiiiuh”, very similar to that of *R. malacoptilus* but perhaps slightly longer, repeated at short intervals; when excited, intermingles song phrase with shorter “pi’wip”, “pit’wip” or “pit’rip” calls. Calls with low “prp” or “prt” notes.

**Habitat.** Broadleaf evergreen forest, secondary growth, and bamboo, at c. 1220–2000 m.

**Food and Feeding.** No information. Skulks on floor and in undergrowth; rummages among fallen leaves. Behaviour similar to that of *R. malacoptilus*.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Scarce within its tiny range, which includes Fan Si Pan National Park.

**Bibliography.** Collar (2006), Delacour & Jabouille (1930, 1931a), King *et al.* (1975), Robson (2000), Tordoff, L. & Manh Hung *et al.* (2002), Tordoff, L. & Trong Dat *et al.* (2001), Vò Quý (1971).

### 152. Sumatran Wren-babbler

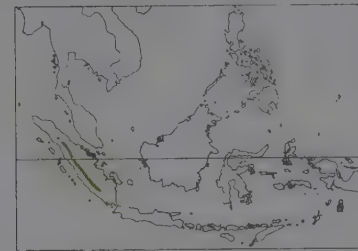
#### *Rimator albostratus*

**French:** Turdinule à raies blanches **German:** Sumatrazwerigsäbler **Spanish:** Ratina de Sumatra

**Taxonomy.** *Rimator albostratus* Salvadori, 1879, Mount Singgalang, western Sumatra.

Formerly considered conspecific with *R. malacoptilus* and *R. pasquieri*. Monotypic.

**Distribution.** W Sumatra S to Mt Dempo.



**Descriptive notes.** 13 cm. Small, almost tailless streaky brown babbler with very long, slightly downcurving bill, white throat and prominent black malar. Crown, nape and head side are dark chestnut-tinged brown with vague buff shaft streaks, dorsal feathering long, dark chestnut-tinged brown, with long narrow whitish-buff shaft streaks disappearing on fluffy dark chestnut-tinged rump, upperwing and tail plain dark chestnut-brown; face (lores, superciliary area, cheek, ear-coverts) slightly paler brown than crown and with indistinct narrow whitish shaft streaks, dark brown moustachial streak and malar line (forming double line);

chin, submoustachial area and throat white or off-white, with slightly soft, oval-shaped edge on upper middle breast; breast side and rest of underparts ochre-tinged mid-brown with long whitish-buff shaft streaks on elongate feathers, streaks broader and whiter on mid-belly, brown thighs and vent; iris chestnut; bill dark greenish-slate to black; legs pale brown to brown. Differs from similar *R. pasquieri* in larger size and longer bill, darker crown with feathers smaller and less patterned, ear-coverts streaked pale, long black malar stripe below narrow whitish submoustachial streak, making white throat much narrower and with less clear-cut lower edge. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a short, clear, bell-like “puu” or “puh”, slightly increasing in volume, and repeated every 4–6 seconds; when excited, mixed with quickly repeated but variable series of “whip’ip” or “whip-wip” calls. Calls with low “wrrt”, “trrrp” or “tr’h” notes.

**Habitat.** Lower montane oak–laurel forest, at 1200–2850 m.

**Food and Feeding.** Presumably invertebrates. Forages on forest floor. Two specimens were obtained when “running on a tall tree trunk”.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Present in Gunung Leuser and Kerinci-Seblat National Parks. Considerable effort was put into seeking more specimens than the two obtained during survey work in 1914, leading to the judgement that the species “must be very rare”.

**Bibliography.** Buij *et al.* (2006), Collar (2006), Holmes (1996), MacKinnon & Philipps (1993), van Marle & Voous (1988), Robinson & Kloss (1918, 1924b).

### 153. Indochinese Wren-babbler

#### *Rimator danjoui*

**French:** Turdinule de Danjou **German:** Kurzschwanzsäbler **Spanish:** Ratina Indochina  
**Other common names:** Danjou’s Babbler, Short-tailed Scimitar-babbler

**Taxonomy.** *Rimator danjoui* Robinson and Kloss, 1919, Lang Bian Peaks [c. 12°02' N 108°26' E], Annam, Vietnam.

Formerly placed in a monotypic genus, *Jabouilleia*, but apart from larger size exhibits no significant differences from present genus. In Vietnam, birds in NE Tonkin (with stronger black malar area and bold black-and-white feathering on belly) represent an as yet undescribed race, and those in Central Highlands of S part of C Annam (with brown of plumage colder and darker, rufous areas duller and paler, underparts and bill roughly intermediate between those of other races) another such. Three subspecies currently recognized.

**Subspecies and Distribution.**

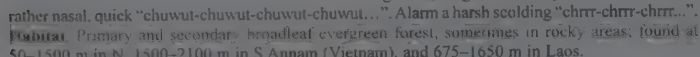
*R. d. naungmungensis* (Rappole *et al.*, 2005) – Naung Mung area of Kachin State, in N Myanmar.  
*R. d. parvirostris* (Delacour, 1927) – Vietnam (SE Tonkin S to N part of C Annam) and adjacent C Laos.

*R. d. danjoui* Robinson & Kloss, 1919 – S Vietnam (S Annam).

**Descriptive notes.** 18–19 cm. Medium-sized short-tailed babbler, brown above, brown, buff and white below, with long, heavy, partly decurved bill. Nominata race has crown and upperparts olive-brown with very narrow pale shaft streaks, fluffy rump olive-brown, upperwing and tail brown with olive tinge; face (lores, supercilium, ear-coverts) grey-tinged olive-brown, long dark brown moustachial and malar lines with buffy submoustachial area, becoming buffy rufous on neck side; chin, throat and upper breast whitish with ochre-edged dark brown streaks (forming narrow necklace on breast), shading below to duller, darker ochreous-brown flanks, thighs and vent, mid-belly

On following pages: 154. White-hooded Babbler (*Gampsorhynchus rufulus*); 155. Collared Babbler (*Gampsorhynchus torquatus*); 156. Yellow-throated Fulvetta (*Pseudominla cinerea*); 157. Rufous-winged Fulvetta (*Pseudominla castaneiceps*); 158. Black-crowned Fulvetta (*Pseudominla klossi*); 159. Golden-fronted Fulvetta (*Pseudominla variegataiceps*); 160. Spiny Babbler (*Turdoides nipalensis*); 161. Iraq Babbler (*Turdoides altirostris*); 162. Common Babbler (*Turdoides caudata*); 163. White-throated Babbler (*Turdoides gularis*); 164. Striated Babbler (*Turdoides earlei*); 165. Slender-billed Babbler (*Turdoides longirostris*); 166. Large Grey Babbler (*Turdoides malcolmi*); 167. Arabian Babbler (*Turdoides squameiceps*).





**Food and Feeding.** Presumably insectivores. Occurs singly, in pairs or in small family parties. Forages on or just above ground, often among dense vegetation. Individuals observed in Laos appeared to be probing soil with the bill.

**Breeding.** Jan-Apr in Vietnam; clutch 2 eggs, perhaps more; family party of four in Vietnam in late May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Annamese Lowlands EBA and Da Lat Plateau EBA. Formerly considered Vulnerable. Generally uncommon, locally fairly common; status in Myanmar unclear. Threatened by forest destruction throughout its range, particularly where it prefers forest at lower altitudes. Present in Nakai-Nam Theun National Biodiversity Conservation Area and the Nakai-Nam Theun Extension, in Laos. In Vietnam, fairly common in Bach Ma National Park and Ho Ke Go Nature Reserve, and present in Thuong Da Nhim and Chu Yang Sin Nature Reserves, and in eight protected areas in the Annamese lowlands; uncommon on Da Lat Plateau.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Delacour (1927), Delacour & Jabouille (1931a), Eames (1995, 2001), Eames, Eve & Tordoff (2001), Eames, Robson *et al.* (1992), Evans & Timmins (1998), Hui *et al.* (2001), Lê Mạnh Hùng *et al.* (2002), Nguyễn Cu *et al.* (2000), Rappole *et al.* (2005), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thewlis *et al.* (1998), Timmins & Trinh Viet Cuong (1999).

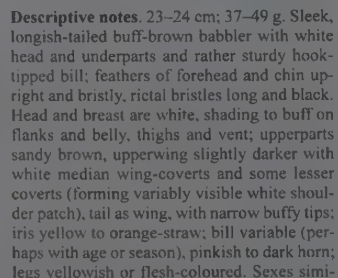
### 154. White-hooded Babbler

**French:** Gampsorin à tête blanche    **German:** Weißkopftimalie    **Spanish:** Timalí Cabeciblanco  
**Other common names:** White-headed Babbler/Shrike-babbler, Indian White-hooded Babbler

**Taxonomy.** *Glampsorhynchus*]. *rufulus* Blyth, 1844, Arakan, Lower Myanmar.

Formerly treated as conspecific with *G. torquatus*. Monotypic.

**Distribution.** SE Nepal E through S Bhutan to all NE Indian hill states, SE Bangladesh, N, W & C Myanmar and S China (W Yunnan).



lar. Juvenile has rufous head and breast side, shading into buff of underparts (usually more extensive, e.g. across breast). Voice. Song presumably an infrequently heard, short, soft mellow series of low whistles, a slightly rising "fui!" and more level "fwur". Typical call a loud hollow, rapid, nervous cackling "uh-uh-jō r'r'r'r'r", the "jō" greatly stressed and highest; first 1-2 notes sometimes given irregularly but frequently, often in manic manner, and sometimes a hollow, slightly accelerating laughter, "khúrk khúrk khúrk-khurk-khurk-khurk". Also brief, edgy, subdued, conversational twangy "éwrt!" notes.

**Habitat.** Bamboo and middle storey of broadleaf evergreen forest, secondary growth, scrub, bushes and long grass at edge of forest; up to 1200 m in India and 1400 m in Nepal, and at 200–900 m in Bhutan.

**Food and Feeding.** Presumably invertebrates. Forages c. 2–7.5 m above ground, mainly in bamboo canopy. Usually not shy, gregarious and noisy, invariably in parties of up to 20 individuals, often in association with other species, including other babbblers, particularly *Pomatorhinus ochraceiceps* and Greater Rufous-headed Parrotbill (*Paradoxornis ruficeps*).

**Breeding.** Apr–Aug. Nest a shallow, flimsy saucer, made of dead leaves, a few small twigs, roots, lichen and a little moss, untidily bound together with cobwebs, roots and tendrils, lined with fine grass, rootlets and tendrils, placed c. 2 m above ground in bush. Clutch 3–4 eggs, variable, pale yellowish, well covered with freckles and blotches of reddish-brown. No other information.

**Movements.** Resident. Apparently some type of displacement may occur, because described as a local migrant in Kawranj National Park, in India.

**Status and Conservation.** Not assessed. Scarce in E Nepal (two records). Uncommon in Bhutan, formerly known from two localities in C & E valleys. Fairly common in India, and present (at least formerly) in what is now Buxa Tiger Reserve (West Bengal), in NE India, present in (at least) Rajahmundry Wildlife Sanctuary, Nandamudi National Park (common) and Mouling National Park, all

in Arunachal Pradesh, occurs in Barail Reserve Forest and uncommon in Kaziranga National Park, both in Assam, and present in Ngengpui Wildlife Sanctuary and Dampa Tiger Reserve, in Mizoram. Rare in Bangladesh in Chittagong Hill Tracts. Locally fairly common in Myanmar. Uncommon in China.

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Barua & Sharma (1999), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2003), Collar (2006), Garthwaite & Ticehurst (1937), Godwin-Austen (1870), Grinnett *et al.* (1998), Hopwood (2012), Inskip & Inskip (1991), Katti *et al.* (1992), Koelz (1954), Mayr (1938), Oates (1883), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Singh (1995), Smythies (1986), Spiereburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1930, 1938), Stuart Baker (1893), Thompson & Johnson (2003).

*Gampsorhynchus torquatus*

**French:** Gambsorin à collier

**German:** Brustbandtimalie

**Spanish:** Timalí Acollarado

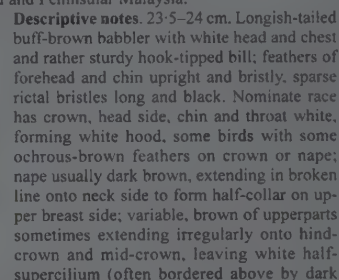
**Taxonomy.** *Gampsorhynchus torquatus* Hume, 1874, no locality = "the banks of the Younzaleen below the Pine forests in the Salween district". Tenasserim, Myanmar.

Formerly treated as conspecific with *G. rufulus*. Three subspecies recognized.

### Subspecies and Distribution.

*G. t. torquatus* Hume, 1874 – SE & S Myanmar (including N Tenasserim), W & N Thailand, S China (S Yunnan), NW & S Laos and C & S Vietnam (C & S Annam, Cochinchina).

*G. t. luciae* Delacour, 1926 – SE Yunnan (China), NE & C Laos and N Vietnam (Tonkin, N Annam).  
*G. t. saturator* Sharpe, 1888 – extreme S Thailand and Peninsular Malaysia.



brown continuation of half-collar); upperparts bright ochrous-brown, upperwing pale grey-brown with ochrous-brown fringes, tail pale grey-brown with whitish tips; breast tinged strongly buffy orange, underparts below this ochrous-buff, with whitish mid-belly (sometimes largely whitish with ochrous-buff flanks), thighs with some whitish and ochrous-brown flecks; iris pale or dull golden; bill greyish-white; legs greyish-brown. Differs from very similar *G. rufulus* mainly in having white of hood stopping at nape, which has partially concealed dark brown collar emerging more obviously on neck side and variably onto breast side, and in being richer, less sandy, above and below, with white shoulder patch much reduced. Sexes similar. Juvenile is thought to be identical to adult, thus different from rufous-headed juvenile of *G. rufulus*. Race *luciae* is rather variable, with rufescent-brown to blackish on crown, and white (with some admixed brown feathers) variably limited to forehead or extending over most of crown, dark collar bolder and more extensive than in other races; *saturator* is like nominate, but slightly darker above, and with more extensive buffy orange on underparts below half-collar. Voice. Song apparently unrecorded. Calls include harsh hard stuttering rattle or cackle, "rrrttttu-rrrttttu-rrrttttu...", "rrrut-rrrut..." or "rrrt-rrrt-rrrtt..."; and similar; also soft, very quiet "wit", "wet" and "weec" notes when foraging.

**Habitat.** Broadleaf evergreen forest, secondary growth, scrub and long grass at forest edge; associates particularly with bamboo. At 500–1800 m, locally down to 50 m in Vietnam.

**Food and Feeding.** Few data. Diet presumably invertebrates. Forages in lower and middle storey, mainly in bamboo. Gregarious and noisy, in parties. Evidence suggests behaviour exactly as that of *G. rufulus*.

**Breeding.** Testes enlarged in early Mar. No other information.

**Movements:** Resident.

**Status and Conservatn.** Not assessed. Generally fairly common, though uncommon in China. Common in Thailand, including in Kaeng Krachan National Park. In Laos, present but evidently local and uncommon in Dong Hua Sao National Biodiversity Conservation Area (NBCA) and present in Phou KhaoKhoay and Nakai-Nam Theun NBCAs, but common in Nam Kading NBCA. Common in Tam Dao National Park and present in Na Hang Nature Reserve, in N Vietnam, and occurs in four protected areas in the Annamese lowlands; scarce in Nam Bai Cat Tien National Park, in Cochinchina.

**Bibliography.** Cheng Tsoh-ho (1987), Cheng Tsoh-shin & Cheng Paolai (1960, 1962), Collar (2006), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Duckworth *et al.* (1998), Eames *et al.* (2001), Engelbach (1932), Hill (2000), Hume & Davison (1878), Kinnear (1929), I.ekagul & Round (1991), Medway & Wells (1976), Meyer de Schauensee (1984), Nguyễn Đức Tu *et al.* (2001), Robinson (1928), Robinson & Kloss (1991a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstenecroft *et al.* (1989), Showler, Davidson, Khounmee Salivong & Kharnkhoun Khounholine (1998), Smith *et al.* (1943), Thewlis *et al.* (1996).

### 156. Yellow-throated Fulvetta

**French:** Pseudominla à gorge jaune    **German:** Gelbkehlalappe    **Spanish:** Fulveta Goligualda  
**Other common names:** Yellow-throated Tit-babbler, Dusky Green Fulveta Tit-babbler

**Taxonomy:** *Minla cinerea* Blyth, 1847, Darjeeling, India.

**Distribution.** Sikkim F to NE Indian hill states (except Meghalaya), S China (SE Xizang, NW Yunnan) and adjacent N Myanmar; also SE part of N Laos and adjacent Vietnam (N Annam).







**Descriptive notes.** 10–11.5 cm. Tiny greyish babbler with yellow-fronted chestnut crown, white face with bold vertical subocular bar, and black and yellow wingpanels. Forehead is bright yellow, mid-crown to nape dull chestnut with narrow whitish shaft streaks, shading rustier on nape; upperparts olive-grey, upperwing and tail darker, plainer grey, but greater and primary wing-coverts black, carpal area white, fringes of flight-feathers yellow but black fringes of inner primaries (forming large wing flash with inner black panel); eyering (except for black frontal border), broad postocular supercilium, ear-coverts and nape sides

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Collar *et al.* (2001), Dowell *et al.* (1997), King (1989a), Lee Kwok Shing *et al.* (2006), Meyer de Schauensee (1984), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Yen Kwokying (1934a, 1936), Zheng Zuoxin *et al.* (1987).

**Movements.** Resident.

**Bibliography.** Ali & Ripley (1971), Fleming (1953, 1959), Grinnett *et al.* (1998), Inskip & Inskip (1991), Proud (1959), Rand & Fleming (1957), Rasmussen & Anderton (2005), Ripley (1950b, 1953), Shrestha (1998), Stattersfield *et al.* (1998).

**Bibliography.** Al-Dabbagh & Bunni (1975, 1981), Cramp & Perrins (1993), Diessehorst (1962), Donaghy (2006), Harrison (1982), Hartert (1909), Kainady (1982), Murdoch (2005a), Richardson (2006), Scott *et al.* (1975), Snow & Perrins (1998), Stattersfield *et al.* (1998), Vaurie (1953b).

**Descriptive notes.** 20–26 cm; 30–40 g. Fairly small to medium-sized *Turdoides* babbler with rather slim decurved bill, fairly strong streaking above, mostly plain white and buff below but with some streaking on breast side or on breast. Nominative race has crown and upperparts dark buff (sometimes tinged cinnamon) with brown-edged dark brown streaks, becoming more diffuse on rump; buff-grey edges on mid-brown upwinging, and greyish-buff tail with dense but indistinct brown barring around shaft of central feathers. Iores and cheeks pinkish-tan, ear-coverts pinkish-tan to



**Habitat.** Scrub and bushes in semi-desert, borders of cultivation, thorn hedges, thickets, even in compounds; lowlands to 600 m.

**Distribution.** 25–27 cm. Very long-tailed, fairly large *Turdoides* babbler, dark-streaked above, with white breast and buffy-rufous belly. Forecrown and short narrow supercilium are greyish-white with narrow black streaks, shading to pinkish mid-brown with longer narrow black streaks on rest of crown and nape; and to pale olive-brown on back, upperwing and tail, tail with faint

**Bibliography.** Harington (1914a), Macdonald (1907), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Stanford (1932), Stanford & Ticehurst (1930), Stattersfield *et al.* (1998), Siresemann & Heinrich (1940a), Wood & Finn (1902).

A map of South Asia, including India, Pakistan, and Bangladesh, with a shaded region indicating the distribution of the genus *Pteropus*. The shaded area covers the northern and northeastern parts of the Indian subcontinent, including the Himalayan region and the northeastern states of India and Bangladesh.

**Bibliography.** Ali & Ripley (1971), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Christison *et al.* (1946), David & Gosselin (2002b), Gaston (1978d), Godwin-Austen (1870), Grimmett *et al.* (1998), Harington (1909), Hume & Oates (1889), Inskipp & Inskipp (1991), Javed & Rahmani (1998), Khan (2005), Koelz (1954), Kylänpää *et al.* (2010), Macdonald (1907), Rasmussen & Anderson (2005), Robson (2010), Singh, A.P. (2000), Singh, P. (1998), Smythes (1986), Stanford & Ticehurst (1930), Stuart Baker (1893).



*Turdoides longirostris*

**Taxonomy.** *Pyelorchis longirostris* F. Moore, 1854, Nepal.

Also (race unknown) SW Myanmar.

*Turdoides malcolmi*

*Turdoides squamiceps*

A map of the Middle East and surrounding regions, including the Arabian Peninsula, the Indian subcontinent, and parts of North Africa and Europe. The study area, located in the northwestern part of the Arabian Peninsula, is highlighted in green. The map shows major geographical features and the location of the study area relative to the surrounding regions.

**Breeding.** Feb–Jul in Israel, May in United Arab Emirates and Mar–Apr in Oman; up to four broods may be produced by one female per season; dry conditions depress breeding activity in desert areas, but not near human settlements. Co-operative breeder, living throughout year in social groups of 2–23 (usually 6–13) individuals in territories of 0.2–1 km<sup>2</sup>; groups may be simple (with single breeding male), or multi-male (several males compete for or mate with new dominant female, subsequently reverting to simple structure as one male achieves dominance), or complex (several females and several males breeding together following break-up of previous structure owing to death and/or invasion). Nest, built mainly by dominant male and female, often assisted by other group-members, a large, untidy, rather deep cup, sometimes slightly domed, made of grasses, rootlets, twigs, bark and similar dead material, unlined or lined with some hair and a few feathers, placed up to 7 m above ground in tree fork, crown of bush or similar sheltered site; only one active nest in group territory at any one time. (Clutch laid by dominant female 3–5 eggs (other females often lay in same nest, so that nest can contain 6–13 eggs), plain turquoise; incubation by male.

females in group, period 14–15 days; chicks brooded and fed by all of group, nestling period 14 days, sometimes 17–19 days; fledglings fed by all group-members for up to c. 8 weeks; c. 30% of males remain in and inherit natal breeding group and territory, while c. 50% move to adjacent territory (most dominant son in group typically invades neighbouring territory, taking with him younger male siblings except second-ranking son, which stays in natal group); most females disperse to other groups at 2–4 years (typically in small party led by dominant daughter with younger female siblings or widowed mother), 50% settling in neighbouring territory while others may cross 3–4 territories. Single-female clutches generally more successful than multiple-female clutches, owing to egg breakages by disputing females and to smothering of late-hatching chicks by older nestlings; much nest failure due to intra-group and inter-group conflict, also to predation by snakes and, to lesser extent, Southern Grey Shrike (*Lanius meridionalis*). Age of first breeding 2 years, although many individuals not until much later, e.g. 6 years. Oldest ringed individual at least 15 years; annual mortality of first-years 32–62%.

**Movements.** Resident. In Israel, individuals may move only a few kilometres from their parental territories. In C' Arabia can be rare in Nov–Jan, suggesting that there is some degree of winter

dispersal; in S Oman disperses into desert after breeding, with groups reassembling in following spring.

**Status and Conservation.** Not globally threatened. Local breeder in F: Sinai, in Egypt. In Israel, locally fairly common from Dead Sea S into Negev Desert, numbers having expanded since 1950s in response to human colonization and agricultural settlement; rough estimate suggests a few hundred groups present in country, with total of 17 groups in 65 km<sup>2</sup> in S Arava in 1985, and 15–23 groups (totalling 65–220 individuals) in 25 km<sup>2</sup> around Hazeva in 1979–1983. Widespread but local, and relatively uncommon in Oman.

**Bibliography.** Abraham (2006), Anava *et al.* (2000, 2001a, 2001b, 2001c, 2001d, 2002), Bishop & Groves (1991), Brown (1975), Carlisle & Zahavi (1986), Castell (2000), Cramp & Perrins (1993), Edelaar & Wright (2006), Gallagher & Woodcock (1980), Goodman & Meininger (1989), Jamieson & Marshall (1999), Kalishov *et al.* (2005), Kam *et al.* (2003), Lundy *et al.* (1998), Maklakov (2002), Naguib *et al.* (1999), Ostreicher (1997, 1999, 2001, 2003, 2006), Pozis-François *et al.* (2004), Shirihai (1996), Wardman & Warrington (1997), Wright (1997, 1998a, 1998b, 1999), Wright & Dingemanse (1999), Wright, Berg *et al.* (2001a, 2002b), Wright, Maklakov & Khazin (2001c), Wright, Parker & Lundy (1999), Zahavi (1974, 1988, 1989, 1990, 1995).







## 168. Fulvous Babbler

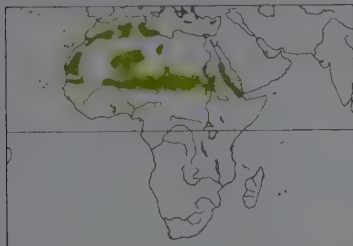
### *Turdoides fulva*

French: Crat  pe fauve German: Akaziendrossling Spanish: Turdoide Rojizo  
Other common names: Fulvous Chatterer

**Taxonomy.** *Turdus fulvus* Desfontaines, 1789, Gafsa, Tunisia. Has been thought to form a superspecies with *T. rubiginosa*. Four subspecies recognized.

#### Subspecies and Distribution.

*T. f. maroccana* Lynes, 1925 – NE Morocco and NW Algeria.  
*T. f. fulva* (Desfontaines, 1789) – N Algeria, Tunisia and NW Libya.  
*T. f. buchanani* (E. J. O. Hartert, 1921) – WC Mauritania and N Senegal E to S Algeria and W Chad.  
*T. f. acaciae* (M. H. C. Lichtenstein, 1823) – N & E Chad, N & C Sudan, N Eritrea and N Ethiopia; also extreme S Egypt (at least formerly).



**Descriptive notes.** 25 cm; 46–70 g. Medium-sized sandy-brown featureless *Turdoides* babbler with whitish throat, blackish bill and longish graduated tail. Nominat race is rufescent-tinged sandy brown above, crown with fine dark streaks, upperparts with more diffuse dark streaks on mantle and back; lores to ear-coverts dusky greyish-brown, neck side greyish sandy-brown with diffuse dark streaks; chin whitish, throat, upper breast, flanks and vent bright sandy buff, with faint buff shaft streaks on upper breast; lower breast to belly creamy buff; iris brown to reddish-brown; bill greyish-black; legs olive-brown to yellowish-grey.

Sexes similar, but male has a touch of yellow at base of bill. Juvenile is paler, more yellowish-buff above, than adult, with grey iris and no crown streaks. Race *maroccana* is slightly darker above than nominate, with sandy-rufous wash on breast and flanks, iris pale grey; *buchanani* has paler crown, slenderer bill; *acaciae* has greyish-brown crown, yellowish bill with dark tip. **Voice.** Varied, but chorus song unreported. Main contact call a series of 6–10 loud, clear, descending whistles lasting altogether 2–3 seconds, the first note longest, "peeeoooo, peeeo-peeeo-peeeo-peeeo-peeeo". Other calls include shimmering metallic trill, "rtrrrrrrrrr", which rises and falls in pitch and intensity, possibly in mild alarm; a descending trill in distraction display; a high wavering tremolo by female on nest when fed by group-member; sharp "pwit" in high alarm; short twanging "pip" or "pee" in flight; quiet "cheep" while foraging.

**Habitat.** Desert scrub, bush-studded dry grassland, thorny desert thickets, tree clumps in barren arid land, and dry riverbeds, keeping to lower parts of shady thorn trees such as *Acacia*, *Ziziphus* and *Capparis*, and *Phoenix* palm clumps and *Tamarix* in wadis and oases; depressions with *Rhus tripartita*; will use *Eucalyptus* plantations, introduced tobacco stands and thorn-brake fencing.

**Food and Feeding.** Invertebrates, small seeds, grain and berries (notably of *Ziziphus* and *Salvadora*), varying seasonally. Animal items include small beetles (Coleoptera) and grasshoppers (Orthoptera) as commonest prey, also caterpillars, flies (Diptera), ants (Formicidae) and termites (Isoptera), one stomach holding 6 beetles and 50 termites, another (juvenile) 7 large caterpillars. Becomes tame and bold if provisioned in desert camps, taking scraps of dough, dead moths and pieces of meat. Forages mainly on ground, probing with bill at earth or in bases of palm fronds near ground; seen to extract larvae from basal fleshy leaves and underground rootstock of awn grass (*Aristida pungens*), using feet and bill. Found in small parties of 4–5 individuals, sometimes up to twelve; mean of 33 flocks 5.7 (Sudan), of 83 flocks 5 (Morocco).

**Breeding.** Apr and Aug in Mauritania, and Jan–Jun and recently fledged juveniles in Sept and Nov in Morocco; Nov–Jul (mostly Mar–Apr) in Algeria, Mar–Jul in Tunisia, Feb in Libya and May–Oct in Mali; adults feeding young in Jun–Jul in Niger; Aug (wet-season breeder) in Chad; Nov and Jan–May (including Mar–Apr at Gebel Elba) in Sudan and Nov and Mar in Ethiopia. Co-operative, probably monogamous breeder, with helpers (immatures); at six nests in Sudan, five pairs had one such helper and the other had two. Nest a loose deep cup of thin twigs, long coarse dry grass, rushes and bulrush (*Typha*) leaves, sparsely lined, placed 1–2 m up in dense thorn bush (*Ziziphus*, *Balanites*), brushwood or palm crown, once in dense prickly side growth of date palm. Clutch 3–6 eggs, usually 4–5 (mean of 24 clutches in Algeria 4.3), greenish or turquoise-blue. No information on incubation and nestling periods. Fan-tailed Raven (*Corvus rhipidurus*) known to prey on nests.

**Movements.** Resident; also short-distance nomad in response to rains.

**Status and Conservation.** Not globally threatened. Frequent and locally common in Morocco and adjacent Algeria, Tunisia and N Libya. Rare in Senegal, where possibly a recent colonist. Frequent in R Senegal valley, in Mauritania. Locally frequent in Niger. Frequent and widespread in Tibesti, in Chad. Common in middle latitudes E to Blue Nile, in Sudan. In Egypt, became extinct in Nile Valley following construction of Aswan High Dam in 1960s, but still common around Gebel Elba, on coastal Egyptian–Sudanese border.

**Bibliography.** Barlow *et al.* (1997), Borrow & Demey (2001), Bundy & Morgan (1969), Cave & Macdonald (1955), Cramp & Perrins (1993), David & Gosselin (2002b), Densley (1993),   tch  copar (1970), Fry *et al.* (2000), Goodman & Atta (1987), Goodman & Meininger (1989), Isenmann & Moali (2000), Ledant *et al.* (1981), Morel & Morel (1990), Nikolaus (1987), Th  venot *et al.* (2003), Thomsen & Jacobsen (1979), Urban & Brown (1971), Vaurie (1954b).

## 169. Bare-eyed Babbler

### *Turdoides aylmeri*

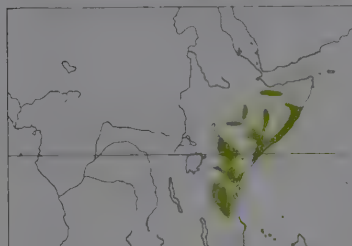
French: Crat  pe d'Aylmer German: Schuppenbrustdrossling Spanish: Turdoide de Aylmer  
Other common names: (Pale-billed) Scaly Babbler, Scaly Chatterer

**Taxonomy.** *Argya aylmeri* Shelley, 1885, Somalia.

Races *boranensis*, *keniana* and *mentalis* are all very similar, each exhibiting apparent colour variation; taxonomic reassessment perhaps warranted. Proposed race *loveridgei* (SE Kenya and extreme NE Tanzania) considered synonymous with *keniana*. Four subspecies recognized.

#### Subspecies and Distribution.

*T. a. aylmeri* (Shelley, 1885) – Somalia and SE Ethiopia.  
*T. a. boranensis* (Benson, 1947) – S Ethiopia and N Kenya.  
*T. a. keniana* (F. J. Jackson, 1910) – C & S Kenya and immediately adjacent NE Tanzania.  
*T. a. mentalis* (Reichenow, 1887) – NE & EC Tanzania.



**Descriptive notes.** 21–23 cm; 31–42 g. Small *Turdoides* babbler with long graduated tail, grey-brown above with rusty crown, buff below with small scaling and spotting on breast. Nominat race has crown and head side dull rusty brown with small buff flecks, upperparts, including upperwing and tail, paler ashy brown; lores pale buff, bare skin around and behind eye pale blue or bluish-grey, cheek, ear-coverts and neck side pale brown with buffy mottling; chin to breast pale brown to mid-brown with dense buff scaling or spotting, flanks greyish-buff, belly and vent warm buff; iris yellow to yellowish-white; bill pale yellowish-horn; legs pale horn-brown. Sexes similar. Juvenile is browner, less ashy, above than adult, scaling less distinct or absent, bill bronzy brown, paler at base, iris brown. Race *boranensis* is darker brown overall than nominate, with blackish-chestnut crown, rufescent sandy-buff underparts; *mentalis* is like previous, but slightly more ashy brown; *keniana* is richer brown generally, head more chestnut-brown, pale brown below. **Voice.** Chorus song unreported, but voice poorly known. Continuous mouse-like squeaking from foraging flock, described also as a "squeaking wood-screw" and "metallic, scraping and ratchet-like", varied by thin high chatter and broken whistling.

**Habitat.** Dense, arid thorn-scrub, woodland undergrowth, bushland, riverine thickets, tall thorn-brakes enclosing fields, dense euphorbias, grass and aloes, *Sansevieria* belts where planted to make corrals; favours *Commiphora*, at least in parts of Ethiopia, and in Somalia noted particularly where thornbush intermingles with clumps of *Euphorbia*. Found at 915–1370 m in Ethiopia; to 1350 m in Somalia and to 1500 m in Kenya.

**Food and Feeding.** Diet apparently unreported; presumably mainly invertebrates and small fruit and seeds. Found singly, in pairs or in small groups of 5–10 individuals.

**Breeding.** Mar–Apr and Aug–Sept in Ethiopia and Dec in N Tanzania. One nest described as a rather large, strong cup made of twigs and stems, lined with fine grasses, and placed 1.5 m up in bush among aloes and euphorbias. Full clutch size apparently not documented; eggs pale blue-green. A group of this species seen to mob a puff-adder (*Bitis*). No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. Very common (locally one of the commonest bird species) but patchily distributed in NW Somalia; uncommon in Ethiopia; uncommon and very local in Kenya and Tanzania.

**Bibliography.** Archer & Godman (1961), Ash & Miskell (1983, 1998), Benson (1946), Britton (1980), David & Gosselin (2002b), Erlanger (1905), Friedmann (1937), Fry *et al.* (2000), Fuggles-Couchman & Elliott (1946), Jackson & Schlater (1938), Lewis & Pomeroy (1989), Stevenson & Fanshawe (2002), Urban & Brown (1971), Zimmerman *et al.* (1996).

## 170. Rusty Babbler

### *Turdoides rubiginosa*

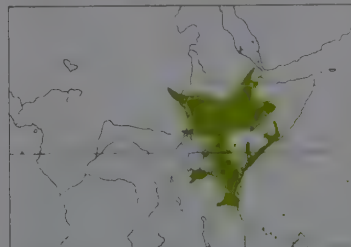
French: Crat  pe rubigineux German: Heuglindrossling Spanish: Turdoide Herrumbroso  
Other common names: Rufous Chatterer

**Taxonomy.** *Crateropus rubiginosus* R  ppell, 1845, Shoa, Ethiopia.

Often placed in genus *Argya*. Has been thought to form a superspecies with *T. fulva*. Races *bowdleri* and *schnitzeri* previously referred to as, respectively, *sharpii* and *emini*, but last two names are preoccupied. Four subspecies recognized.

#### Subspecies and Distribution.

*T. r. rubiginosa* (R  ppell, 1845) – S Sudan, NE, C & S Ethiopia, S Eritrea, Djibouti, NE Uganda and Kenya (except SE).  
*T. r. bowdleri* Deignan, 1964 – SE Ethiopia and adjacent NE Kenya.  
*T. r. heuglini* (Sharpe, 1883) – S Somalia, SE Kenya, and NE & E Tanzania.  
*T. r. schnitzeri* Deignan, 1964 – N & NC Tanzania.



**Descriptive notes.** 19–23 cm; 33–61 g. Smallish *Turdoides* babbler, olive-brown above and yellowish-rufous below. Male nominate race has crown, upperparts, upperwing and tail brown with warm olive tinge, forehead marginally darker with narrow silvery-white streaks; lores, ear-coverts and neck side olivaceous grey-brown, cheek and subnuchal area pale brownish-buff; chin pale buff, becoming rufous-buff on throat and yellowish-rufous on remaining underparts, breast with almost imperceptible fine whitish shaft streaks; iris clear pale yellow to straw; slightly decurved bill olive-brown on upper mandible, paler and greenish on lower mandible, or all horn with flesh base of lower mandible; legs pale greyish-brown to flesh-olive. Female is like male, except for pale greenish-yellow iris. Juvenile is paler than adult, more russet above, with greyish-brown iris and fewer silvery-white streaks. Race *bowdleri* is larger than nominate; *heuglini* is darker above, richer brick-red below, with pale rufous lores, indistinct narrow blackish streaks on crown and mantle; *schnitzeri* is warmer and browner above, richer below, with more silvery-white streaks on crown (giving greyish appearance), shorter wing, somewhat thinner bill. **Voice.** Chorus song involves group participation in presumed male song, more usually given alone: a tinkling twitter series of 4–9 notes, often rising in pitch and sometimes

On following pages: 171. Rufous Babbler (*Turdoides subrufa*); 172. Jungle Babbler (*Turdoides striata*); 173. Orange-billed Babbler (*Turdoides rufescens*); 174. Yellow-billed Babbler (*Turdoides affinis*); 175. Black-lored Babbler (*Turdoides melanops*); 176. Sharpe's Babbler (*Turdoides sharpei*); 177. Dusky Babbler (*Turdoides tenebrosa*); 178. Reinwardt's Babbler (*Turdoides reinwardtii*); 179. Brown Babbler (*Turdoides plebejus*); 180. White-headed Babbler (*Turdoides leucocephala*); 181. Arrow-marked Babbler (*Turdoides jardineii*); 182. Scaly Babbler (*Turdoides squamulata*); 183. Northern White-rumped Babbler (*Turdoides leucopygia*); 184. Southern White-rumped Babbler (*Turdoides harilaui*); 185. Hinde's Pied Babbler (*Turdoides hindei*); 186. Northern Pied Babbler (*Turdoides hypoleuca*); 187. Southern Pied Babbler (*Turdoides bicolor*); 188. Bare-cheeked Babbler (*Turdoides gymnogyns*).



decreasing in pitch and volume. "pa-pee-pee-see-pit-hy-see-ah" or "tsce-see-see-ee-ee-ah" or "skeek-eeek-eeek-eeet-tee-peeet-peeet". Common call a shrill descending quavering "tschyeerss", repeated at intervals of 2–3 seconds; other calls include variety of growling, guttural and chattering notes, a curious soft "kwier" or "pseececo" (may be an alarm note), soft "pee", "dit", also "peew" notes (these last presumably among the high-pitched soft notes reported as often missed by observers).

**Habitat.** Mixed thorn and semi-leaved open forest, thickets in grassy *Commiphora* and *Acacia* woodland, thick matted growth inside juniper woods, thick bush along and between rivers or other dense cover, bushes in dry grassland, bushy luggas, degraded bushland, dry savanna, thick coastal scrub with baobabs, thickets, gardens, bushy pastures. Found at up to 1220 m in Tanzania, and over 2000 m in Kenya; generally in lowlands in Uganda, but to 2000 m on Mt Morongole; 1220–1675 m in Ethiopia.

**Food and Feeding.** Mainly invertebrates, including termites (Isoptera); also mango and papaya rinds. Forages on ground in leaf litter under bushes, bounding about, pulling at, picking and tossing debris about, tearing at wax and debris at honeyguide (Indicatoridae) feeders. Found in groups of 3–13 individuals, usually 4–5. Subordinate to *T. plebejus*, but groups follow those of latter, foraging behind them, bathing after them, approaching them to observe, occasionally feeding with them; forages also with francolins (*Francolinus*) at times, and with other birds.

**Breeding.** Aug. and feeding young in Jun, in Ethiopia and nest-building in Mar in Somalia; all year in E Africa, although Apr–Oct in Uganda; probably multi-brooded. Lives in territorial group, occupying relatively large area (so that groups rarely near one another); co-operative breeder. Nest an untidy open cup made of thin twigs, plant stems, leaves, leaf rims, and rush-like or other grasses (often with living stems woven in), lined, sometimes scantily, with roots and fine grasses or grass heads, placed 0.3–3 m up in creeper tangle, thick bush or leafy tree, once in dense mass of *Bougainvillea*. Clutch 2–4 eggs (usually 3 in Ethiopia), blue. No information on incubation and nestling periods. Brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) occurs. Nest destruction by primates recorded.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Frequent to common in Rift Valley and NE Ethiopian lowlands near Djibouti, and frequent in S. Common in SE Sudan and N Uganda. In Somalia, locally very common in the Jubba and lower Shabelle valleys and adjacent coastal plains. Known to be present at 98 localities in Tanzania by year 2000.

**Bibliography.** Ash & Miskell (1983, 1998), Benson (1946), Britton (1980), Carswell *et al.* (2005), Cave & Macdonald (1955), David & Gosselin (2002b), Duckworth *et al.* (1992), Erlanger (1905), Friedmann (1937), Fry *et al.* (2000), Harvey (1974), Huels (1982), Jackson & Selater (1938), Lewis & Pomeroy (1989), Nikolaus (1987), Safford *et al.* (1993), Schmidt (1982), Selater & Moreau (1932), Serle (1943), Short & Horne (2006), Stevenson & Fanshawe (2002), Urban & Brown (1971), Zimmerman *et al.* (1996).

## 171. Rufous Babbler

### *Turdoides subrufa*

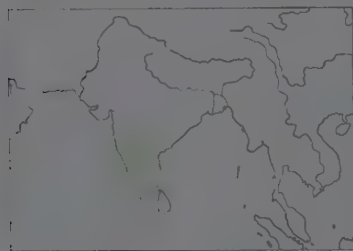
**French:** Cratérope roussâtre **German:** Graustrindrossling **Spanish:** Turdoide Rufo  
**Other common names:** Rufous-backed Babbler

**Taxonomy.** [Himalia]. *subrufa* Jerdon, 1839, the Wynaad, near Manantoddy, Tamil Nadu, India. Two subspecies recognized.

**Subspecies and Distribution.**

*T. s. subrufa* (Jerdon, 1839) – W peninsular India S to S Karnataka and N Tamil Nadu.

*T. s. hyperythra* (Sharpe, 1883) – SW India (Kerala and W Tamil Nadu).



**Descriptive notes.** 24–25 cm; 57–78 g. Medium-sized *Turdoides* babbler, rich brown above and rufous below, with fairly stout black and yellow bill, dark lores and greyish forehead. Nominata race has forehead to mid-crown dull grey with dense fine black lines, shading to rich olive-tinged brown on rest of crown and upperparts, upwelling and tail, tail with barely visible close barring; lores darkish brown-grey, head side otherwise as hindcrown; entire underside dull rufous, buffier on mid-line of belly, greyer and darker on flanks and dusky on vent; iris creamy white to dark grey; upper mandible dark horny

brown, lower mandible bright yellow; legs dusky yellow. Sexes similar. Juvenile is deeper, richer brown above than adult. Race *hyperythra* is more richly coloured than nominate. Voice. Calls given in chorus are bursts of very rapid, shrill whistling trills, "tree-tree-tree", notes short, reedy, variably pitched and similar in quality to sound of a large cricket (Orthoptera), sometimes without a break for 10 seconds or more, preceded and punctuated occasionally by one or two harsh squeaks. Same squeaks constitute alarm call; also gives harder churring and clicking "tsu-wick!" or "tschick!", sometimes combined with or leading into trills.

**Habitat.** Dense scrub undergrowth in more open broadleaf evergreen and moist deciduous forest, forest edge, overgrown clearings, dense scrub and tall grass, bamboo brakes, mixed woodland and grass, abandoned coffee plantations; at 825–1220 m.

**Food and Feeding.** Insects, also berries (particularly of *Lantana*), and nectar of *Erythrina*, *Salmaal* and other flowers. Found in parties of 6–8 individuals. Forages on ground, but ventures up into trees. Very skulking, usually creeping about out of sight in low vegetation.

**Breeding.** Feb–Nov, mainly Feb–May. Nest a large rough strong deep cup made of leaves, grasses, ferns and fern stems, lined with fine grasses and roots, placed in bush or small tree. Clutch usually 4 eggs, clear blue with faint greenish tinge. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Western Ghats EBA. Rare in N sector of range, but fairly common in Kerala and W Tamil Nadu. Present in Mudumalai National Park (Tamil Nadu), and in surveys 1973–1997 found in 23 areas, including eight protected areas, namely Sultan's Battery, Silent Valley, Parambikulam, Munnar, Periyar East, Periyar West, Termini and Akashan.

**Bibliography.** Ali (1942), Ali & Ripley (1971), David & Gosselin (2002b), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Hume & Oates (1889), Rasmussen & Anderson (2005), Stattersfield *et al.* (1998), Whistler & Kinnear (1932), Zacharias & Gaston (1993, 1999).

## 172. Jungle Babbler

### *Turdoides striata*

**French:** Cratérope de brousse **German:** Dschungeldrossling **Spanish:** Turdoide Matorralero  
**Other common names:** Striated Babbler; Deccan Babbler (*somervillei*)

**Taxonomy.** *Cossyphus striatus* Dumont de Sainte Croix, 1823, Bengal, India.

May form a superspecies with *T. rufescens*, and has been treated as conspecific. Race *somervillei* sometimes thought to represent a separate species, but intergrades with *malabarica*. Proposed race *orissae* (from E India) treated as synonymous with nominate. Five subspecies recognized.

**Subspecies and Distribution.**

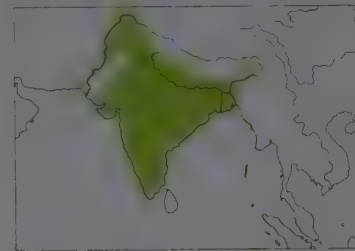
*T. s. sindiana* (Ticehurst, 1920) – Pakistan (R Indus plains) and NW India (from Himalayan foothills, Punjab and Haryana S to Rann of Kutch).

*T. s. striata* (Dumont de Sainte Croix, 1823) – Himalayan foothills from SE Himachal Pradesh E to S Nepal, S Bhutan and W Assam, and S in India to Uttar Pradesh, Bihar, S West Bengal and NE Andhra Pradesh, and Bangladesh.

*T. s. somervillei* (Sykes, 1832) – W peninsular India (S to Goa).

*T. s. malabarica* (Jerdon, 1845) – SW India.

*T. s. orientalis* (Jerdon, 1845) – peninsular India except W & NE.



**Descriptive notes.** 25 cm; 55–84 g. Medium-sized *Turdoides* babbler with pale eye, whitish lores, yellow bill and dull brownish-grey plumage, softly streaked on back and breast. Nominata race has crown and nape brownish-grey, upperparts drab grey-brown, mantle and back with a few long, soft-edged dark brown streaks, rump and uppertail-coverts greyish, tinged yellowish-rufous on uppertail-coverts; upperwing dark brown with ashy edges, tail dark greyish-brown, darker and noticeably barred towards tip; lores whitish with narrow dark line above, face and neck side plain brownish-grey; chin and throat pale dull grey with vague darker

bars, breast ashy yellowish with paler feather centres and shafts, belly, vent and undertail-coverts dull yellowish-rufous, tinged brown on flanks and with faint white shaft streaks; iris yellowish-white or creamy white, orbital skin pale yellow; bill yellow, yellowish-white, dirty whitish or, rarely, pale horny yellow; legs fleshy-yellow to yellowish-white. Sexes similar. Juvenile is paler than adult, upperparts and head pale brown, underparts rufescent, brownish on breast, primary fringes ochraceous. Race *sindiana* is more ashy above than nominate, and more creamy buff on belly; *somervillei* is highly distinctive, much browner and rustier overall, striations on mantle less marked, rump and uppertail-coverts yellowish-rufous, tail yellowish-chestnut, flight-feathers blacker, pale centres of breast feathers more pronounced; *malabarica* is more brownish-grey than nominate, particularly on tail; *orientalis* is like nominate but slightly browner above, with rufous tinge at tail end. Voice. A harsh conversational "ke-ke-ke" uttered when on the move, frequently breaking out into loud discordant chorus of squeaking and chattering. Calls include overexcited, peevish, slightly nasal, wheezy, variable chortling, e.g. "(trit, trit, tyurr, tyurr, tyurr, tyurr-tyur-tyit'itritritrit)", each note strongly descending; a gruff "kyarsh", often in series, or delivered rarely almost as rattle, very often accompanied by sharp squeals; subdued single asthmatic toneless "kürshh"; short descending metallic whinny; low, harsh, buzzy, twangy "churweeur, chnur, chnur-chnur..." and variants, long first note ascending and then descending sharply, others level and short; when mobbing predator, rapid sharp rattling interspersed with high-pitched squeals, also a harsher rattling.

**Habitat.** Open forest and secondary forest, patches of moist deciduous forest, scrubland, bamboo, gardens, cashew and jack-fruit gardens, orchards, hedges in cultivation, bushes on waste ground, mango groves, sheesham plantations with tall coarse grass, tamarisk jungle, hillsides with scrub and mixed forest; distribution in Assam may be linked with that of sal (*Shorea robusta*) forest. To 1525 m, locally 1830 m.

**Food and Feeding.** Wide range of invertebrates, mainly insects, including hymenopterans (ants, wasps, ichneumon flies), beetles (Coleoptera), grasshoppers and crickets (Orthoptera), cockroaches (Blattodea), caterpillars, moths (Lepidoptera), mantises (Mantodea), stick-insects (Phasmida), bugs (Hemiptera), also spiders (Araneae); also frogs; also grain, seeds, figs (*Ficus*), berries (including those of *Lantana* and *Ziziphus*), and nectar of *Salmaal*, *Butea*, *Erythrina* and *Helicteres isora*. In one study, plant matter accounted for 56% of diet by weight, involving pulp of fruit, pearl millet, wheat and leafy material; remaining food was lepidopterans (18%), hymenopterans (6%), orthopterans (6%), beetles (4%), snails and spiders (less than 1%), with remaining 10% unidentified. In another study, 22% of total food by volume was insects (mostly beetles), 74% bajra grain (*Pennisetum typhoides*), 4% other vegetable material. Very gregarious, in parties of 6–12 individuals throughout year; large flocks break up into smaller groups during breeding season. Often forms nucleus of mixed-species foraging parties. Occasionally associates with *T. affinis*. Spends much time on ground.

**Breeding.** In India all year, mainly Feb–Oct (with spring and mid-summer peaks) in NW & W and mainly Apr–Dec in SW. Social breeder, but does not nest colonially; different pairs in flock apparently breed consecutively, rather than concurrently; breeding birds continue to remain with a flock, detaching themselves only to attend to nest. Nest, built by both sexes and sometimes one or more helpers, a fairly loose, deep or shallow cup, made of grasses, roots, leaves, creeper tendrils and twigs, scantily lined with rootlets and fine grasses, placed 1.2–9 m (usually 2–4 m) above ground in bush, shrub, hedge, small tree or hollow tree stump. Clutch 3–7 eggs (usually 3–4), pale blue to deep dull blue, often tinged green (perhaps tending darker in S); more than one female may lay in one nest, female eating own new-laid egg recorded; incubation period 15 days; nestlings fed by both sexes, sometimes also by one or more helpers, no information on duration of nestling period. Brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) and Common Hawk-cuckoo (*Cuculus varius*) reportedly common. Of 77 eggs in 23 nests in one study, three failed to hatch; 43% of total eggs laid produced fledged young.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common throughout Indus plains of Pakistan, and fairly common in Dera Ismail Khan district, in N. Fairly common in Nepal. Uncommon in Bhutan, where found primarily in W foothills, but relatively common in Phuntsholing area. Common and widespread in India, and abundant in Rajasthan, Uttar Pradesh and Uttarakhand Pradesh, present ("seen quite regularly") in Rajaji National Park and common in Dudhwa National Park, both in Uttar Pradesh, common in Kaizer Wildlife Sanctuary, in Haryana, abundant on New Forest campus at Dehra Dun and common in Dehra Dun valley, in Uttarakhand, and common in Bhitarkanika Wildlife Sanctuary, in Orissa; present in Buxa Tiger Reserve, in West Bengal, with 5 birds/km<sup>2</sup> in monoculture plantation and 152.2 birds/km<sup>2</sup> in scrub; present in Mudumalai National Park, in Tamil Nadu. Common in Bangladesh.

**Bibliography.** Acharya (1951), Ali & Ripley (1971), Ali *et al.* (1996), Allen *et al.* (1997), Andrews & Naik (1965, 1966, 1972), Barua & Sarmah (2005), Bhattacharyya (1997), David & Gosselin (2002b), Devashayam & Devashayam (1991), Gaston (1976a, 1977, 1978a, 1978b), Gaston & Zacharias (2000), Gaston *et al.* (1979), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Gupta & Mishra (1997), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Janki Rama Rao *et al.* (1980), Javed & Rahman (1998), Kato (1988), Kytinpa (2000).



cellaneous high-pitched notes also given. Calls (by single bird) include high-pitched rapid oscillating chirring, with several notes on one pitch punctuated by stronger, higher-pitched note, "t'it't'it't'it'h'i'h'i,t'it't'it't'it'h'i..."; also given with flock calls. In first alarm a "keek", followed by low soft repeated "kurrr" if intruder persists; and a loud high whistle when fighting or mobbing. Twittering "kikikiki" when separated from group, and loud whining when in distress, summoning other birds; short low "ke" while foraging or preening, used for contact, and low "kekeke" prior to leaving area.

**Habitat.** Open forest and secondary woodland, dry scrub, particularly *Lantana*, cultivation, village precincts, orchards, urban gardens and compounds; in drier, more open areas than those favoured by *T. striata*, although commonly syntopic with latter. Up to 300 m, exceptionally 1000 m, in India; to 1700 m, exceptionally 2100 m, in Sri Lanka.

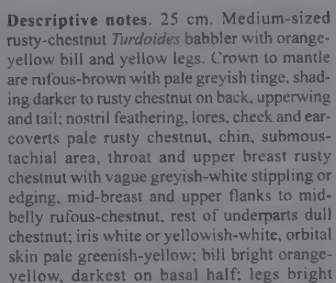
**Food and Feeding.** Insects such as beetles (Coleoptera), grasshoppers (Orthoptera), cicadas (Cicadidae) and other bugs, caterpillars, termites (Isoptera), also spiders (Araneae); also wild figs (*Ficus*), *Ziziphus* and *Lantana* berries, grain, nectar (including that of *Erythrina* and *Butea*), and scraps around habitations. Rarely, whispicoptons (Amblypygi) and even lizards, including garden fence lizard (*Calotes versicolor*). Forages mainly on ground, but occasionally flycatches; often leaps vertically to snatch food item, and gleams from leaves and branches, sometimes while hanging upside-down. In groups; occasionally associates with *T. striata* and *T. rufescens* where ranges overlap.

**Breeding.** All year, mainly Mar–Nov, in India; mainly Nov–Mar in low-country dry zone of Sri Lanka. Co-operative breeder, living in social group of 3–14 individuals with home range 5.3–9.3 ha. Nest, built by both sexes, a loose cup, made of small twigs, rootlets, coarse grasses, green weeds, leaves and old newspaper, lined with fine grasses, fern stems or rootlets, placed 1.2–6 m or higher above ground in thorn bush, hedge, small tree or brambles. Clutch 2–5 eggs, usually 3–4, deep greenish-blue (normally deeper in colour than those of *T. striata* and *T. malcolmi*); incubation period 14–17 days; nestlings fed by both sexes, nestling period c. 14 days; fledglings fed by other flock-members, as well as by parents. Frequent brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) reported. Of 150 eggs in 82 nests in one study, eight failed to hatch; 42% of total eggs resulted in fledged young.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally common in India; common through-

out Sri Lanka except on highest hills. In India, present in Mudumalai National Park and common at Point Calimere, in Tamil Nadu; at Sivakasi, in S India, density was measured at 55 birds/km<sup>2</sup>, but area studied was only 0.2 km<sup>2</sup>; in surveys in 1973–1997 in Western Ghats, found in six areas, including two protected areas, namely Silent Valley and Parambikulam.



undescribed. Voice. In groups, gives constant  
retulant, short, sharply downturned "tscheurk",  
sometimes drawn out into a short trill. Call notes  
"kraa-kraa-kraa" also described; gives other less

bamboo scrub in well-wooded areas; apparently sometimes found in selectively logged forest or up to 2100 m.

black beetles (Coleoptera); also fruit. Gregarious up to 50–60 individuals (mean in one study) and often a primary component. Forages in understorey, gleaning from leaves and working

sses, small twigs and leaves, placed in low fork trunk. Clutch 2-3 eggs, deep greenish-blue. No

ed. Currently considered Near-threatened. Relatively common to common in wet lowlands, but uncommon above 700 m. Common in Sinharaja Forest Reserve and fragmentation in recent decades owing to agriculture, shifting cultivation, fire, urban growth. Distribution is relatively restricted.

art & Stattersfield (2004), Collar *et al.* (2001), Grimmer (1889), Jayasekara *et al.* (2003), Kotagama & Fernando (1978), Rasmussen & Anderton (2005), Stattersfield

*Turdoides melanops*

**French:** Cratérope masqué **German:** Schwarzgesichtdrossling **Spanish:** Turdoide Enmascarado  
**Other common names:** Black-faced Babbler

**Taxonomy.** *Crateropus melanops* Hartlaub, 1867, Damaraland, Namibia.

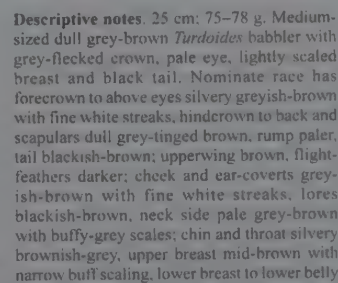
Formerly thought possibly to form a superspecies, and even perhaps to be conspecific, with *T. tenebrosa* and *T. reinwardtii*. Alternatively suggested as part of a superspecies with *T. sharpei*, *T. leucopygia*, and *T. hartlaubii*. Often treated as conspecific with *T. sharpei*. Three subspecies recognized.

**Subspecies and Distribution.**

*T. m. angolensis* A. A. da B. Pinto, 1967 – SW Angola (Huila, E. Namibe).

*T. m. melanops* (Harlaub, 1867) – S Angola and N Namibia.

*T. m. querula* Clancey, 1979 - SE Angola, NW Botswana and NE Namibia (Caprivi), also, disjunctly, extreme W Zimbabwe.



flanks, thighs and vent plainer and darker; iris  
all black; legs slaty black. Sexes similar. Juveniles  
brown iris. Race *angelensis* is shorter-billed than  
*pyrrula* is smaller, darker and greyer, darker-faced,  
parts. VOICE. Chorus song a nasal chattering  
or faster "papapapapapapapapa", all rising to a  
aaaaaaa "yells, bleating squeaks, low "juk" and  
quiet "cull" every 2-3 seconds.

Secondary growth in understorey of dense *Acacia* and  
(*Baikiaea plurijuga*) or purple-pod (*Terminalia*)  
talls tall under high canopy; also dry bush, riverine  
and *Brachystegia* woodland, and camelthorn wood-  
land. At relatively low elevations.

all groups of 5-7 individuals, occasionally up to 15

Mar in Namibia. Co-operative breeder, with up to 10 eggs. Nest lined with finer fibres, placed 1.5–5 m above ground. Clutch? 3 eggs, deep greyish-turquoise. No

4. Uncommon to locally common. Common along  
Karas National Park, in Namibia, uncommon to

*Turdoides affinis*

**French:** Cratélope affin    **German:** Gelbschnabeldrossling    **Spanish:** Turdoide Piquigualdo  
**Other common names:** White-headed Babbler

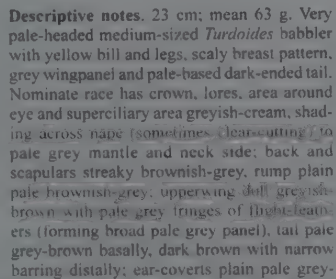
**Taxonomy** *Malacocircus*]. *affinis* Jerdon, 1845, Travancore, India.

Two subspecies recognized.

**Subspecies and Distribution.**

*T. a. affinis* (Jerdon, 1845) – S peninsular India (including Rameswaram I) S from S Maharashtra and SE Madhya Pradesh.

*T. a. taprobanus* Ripley, 1958 – Sri Lanka.



ra, throat and breast dull brown with broad pale  
lower breast and continuing onto plain buff  
pale buff-grey; iris creamy or greyish-white to  
r. Juvenile has less distinct streaks above and  
r. greyer wash than nominate on head and upper  
that scaled pattern much less obvious. Voice  
calls given in excited flocks mainly rapid high-  
time, fading and flaring up again. Isolated, mis-



**Bibliography.** Brewster (1986), Britton (1980), Clancey (1979, 1985), David & Gosselin (2002b), Dean (2000), Fry *et al.* (2000), Ginn *et al.* (1989), Hall & Moreau (1970), Harrison *et al.* (1997), Hockey *et al.* (2005), Penny (1994), Shaw (2001a), Traylor (1965).

## 176. Sharpe's Babbler

### *Turdoides sharpei*

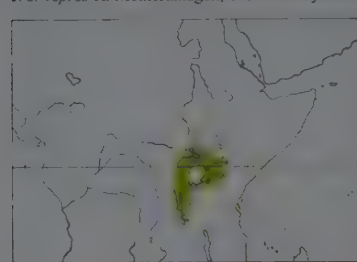
**French:** Cratérope de Sharpe **German:** Schwarzzügeldrossling **Spanish:** Turdoide de Sharpe  
**Other common names:** Sharpe's Pied Babbler

**Taxonomy.** *Crateropus sharpei* Reichenow, 1891, Kakoma, south-west Tanzania. May form a superspecies with *T. squamulata* and *T. hypoleuca*, possibly including also *T. hindei*. Alternatively suggested as part of a superspecies with *T. melanops*, *T. leucopygia* and *T. hartlaubii*. Often treated as conspecific with *T. melanops*. Proposed race *clamosus* (Rift Valley in Kenya) merged with nominate. Two subspecies recognized.

#### Subspecies and Distribution.

*T. s. sharpei* (Reichenow, 1891) – extreme E DR Congo, Rwanda, Burundi, Uganda (except N), SW Kenya and NW & W Tanzania.

*T. s. vepres* R. Meinertzhagen, 1937 – Nanyuki area, on slopes of Mt Kenya (C Kenya).



**Descriptive notes.** 24–26 cm; 66–91 g. Resembles *T. melanops*, but bill shorter, body more streaked, tail not so dark, and underparts with no buff tones; wary. Nominative race has crown, upperparts and upperwing greyish-brown, crown to scapulars lightly scaled or mottled grey (particularly on nape), tail dusky brown; lores to front half of eye blackish-brown, head side plain greyish-brown or pale-mottled dark brown; chin and submoustachial area to breast mouse-grey with pale creamy-grey scales and usually fine brown streaks, belly to vent pale greyish-brown with vague streaking, lower underparts more uniform; iris

silvery white or creamy white; bill black; legs dark slaty brown. Sexes similar. Juvenile lacks paler tips on head and neck, has throat and breast less scaly, iris greyer or browner. Race *vepres* is darker than nominate, with variable creamy white on chin and throat, lower belly often creamy white. **Voice.** Chorus song a babbling “chookááh-chookááh-chookááh...”, having slightly insane and hilarious laughing quality. Calls loud and harsh: contact a high grating “skaaa” or long, downslurring “skaaayaaa” or “nee-yeah”; also has nasal “pa-pa-pa”, sometimes combined into chatter of same petulant quality, a hoarse nasal “wha-u”, and in alarm a cat-like “nyaaa”.

**Habitat.** Forest-edge thickets and scrub, wooded plains and acacia savanna, dense bushland, riverine woodland, elephant grass, gardens; where sympatric with *T. plebejus*, appears to prefer more open areas. Found at up to 2425 m; 1000–2200 m in Kenya, but chiefly 1500–1900 m.

**Food and Feeding.** Mainly invertebrates, also small reptiles and small fruits. Forages in trees (higher up than *T. plebejus*), tall grass and shrubby, coming on to lawns to probe for insects and bounding after termites (Isoptera); creeps about near ground. Usually in parties of 2–10, mainly 4–5 individuals, occasionally in company with other babbler species; also sometimes with *Lamprolaima* glossy starlings, Crested Francolins (*Francolinus sephaena*) and ground-foraging Nubian Woodpeckers (*Campethera nubicola*), wood-hoopoes (*Phoeniculus*) and Crowned Hornbills (*Tockus alboterminatus*).

**Breeding.** Apr–Sept (peak Apr–May) in Uganda, Mar–Dec in Kenya and Mar–Jun in Tanzania. Co-operative breeder. Nest a rather untidy cup made of roots and creeper stems, twigs and grass stems, lined with fine grass roots, creeper stems or other softer materials, placed in dense bush or large isolated bush covered with dead creepers. Clutch 2–3 eggs, dark blue or greenish-blue; nestlings attended and fed by all members of group. No information on incubation and nesting periods. Aggressive towards Levaillant's Cuckoo (*Clamator levaillantii*), which presumably parasitizes nests of present species.

**Movements.** Resident. Recorded in all months in Kampala region of Uganda, but sometimes unaccountably absent for weeks or months.

**Status and Conservation.** Not globally threatened. Locally common in DR Congo; widespread in Rwanda and Burundi; widespread also in Uganda, where present in Murchison Falls National Park; locally common in Kenya, although now vanished from Kikuyu and Mt Nyiru; widespread in Tanzania W of 33° E, with old records from Serengeti National Park.

**Bibliography.** Brown & Britton (1980), Carswell *et al.* (2005), Chapin (1953), Clancey (1985), Fry *et al.* (2000), Jackson & Selater (1938), Lewis & Pomeroy (1989), Schmidt (1982), Short & Horne (2006), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

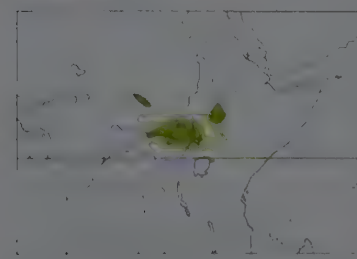
## 177. Dusky Babbler

### *Turdoides tenebrosa*

**French:** Cratérope ombré **German:** Uferdrossling **Spanish:** Turdoide Sombrio

**Taxonomy.** *Crateropus tenebrosus* Hartlaub, 1883, Kudurma (4°45' N, 29°35' E), Sudan. Has been thought possibly to form a superspecies, and even perhaps to be conspecific, with *T. melanops* and *T. reinwardtii*. Monotypic.

**Distribution.** NE Central African Republic, SW, S & SE Sudan, SW Ethiopia, NE DR Congo and NW Uganda.



**Descriptive notes.** 24–26 cm. Dark, medium-sized *Turdoides* babbler with longish bill, white eye, blackish lores, wings and tail, and pale-scaled blackish-brown breast. Forehead is silvery greyish-brown, shading to dark olivaceous brown on crown and upperparts; upperwing and tail blackish-bronzy brown; lores blackish, ear-coverts greyish olive-brown, cheek and neck side olive-brown; chin, submoustachial area, throat and upper breast blackish-brown with pale olive-grey scaling, latter dominating around chin; lower breast and belly centre dull olivaceous greyish-brown, belly side, thighs and vent warm dull olive-brown; iris yellow-

ish-white; bill black; legs dull dark brown. Sexes similar. Juvenile is rather paler above than adult, wings and tail warmer and browner, throat and breast grey with faint streaks (lacking scaly appearance), much browner on belly, iris pale greyish-yellow. **Voice.** Chorus song not reported, and voice little known. Call an occasional hoarse “chow”, with louder, repeated nasal “what-cow” from male.

**Habitat.** Undergrowth of hilly woodlands and other dense cover near water, at 600–1200 m.

**Food and Feeding.** Invertebrates, including beetle larvae (Coleoptera), small snails, small millipedes (Diplopoda); also fruit. Found in pairs or small parties; shy and secretive.

**Breeding.** Apr and Jul in Sudan, Feb–Apr and Jun in Uganda and Dec in DR Congo. Nest a fairly deep cup made of dried leaves and grasses, lined with rootlets, like that of *T. melanops* but less bulky, and usually placed 1–2 m up in thick cover with creepers. Clutch 2–3 eggs, very glossy pale blue. No other information.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Present but uncommon in Manovo-Gounda-Saint Floris National Park, in Central African Republic; rare in Sudan, but possibly locally common in far S & SE; frequent in SW Ethiopia; fairly common at Faradje, in DR Congo; present in Mount Kei White Rhino Sanctuary, in Uganda.

**Bibliography.** Borrow & Demey (2001), Britton (1980), Brown & Britton (1980), Carswell *et al.* (2005), Cave & Macdonald (1955), Chapin (1953), David & Gosselin (2002b), Fry *et al.* (2000), Hall & Moreau (1970), Nikolaus (1987), Stevenson & Fanshawe (2002), Urban & Brown (1971).

## 178. Reinwardt's Babbler

### *Turdoides reinwardtii*

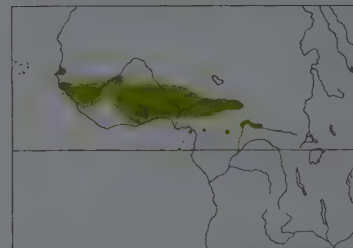
**French:** Cratérope à tête noire **German:** Weißaugendrossling **Spanish:** Turdoide Cabecinegro  
**Other common names:** Blackcap/Black-eyed Babbler

**Taxonomy.** *Crateropus Reinwardtii* [sic] Swainson, 1831, “Indian Islands”; error = Senegal. Has been thought possibly to form a superspecies, and even perhaps to be conspecific, with *T. melanops* and *T. tenebrosa*. Two subspecies recognized.

#### Subspecies and Distribution.

*T. r. reinwardtii* (Swainson, 1831) – Senegal E to Mali and Sierra Leone.

*T. r. stictilaema* (Alexander, 1901) – N Ivory Coast, S Burkina Faso and Ghana E to Cameroon, S Chad, WC & S Central African Republic and extreme N DR Congo.



**Descriptive notes.** 25–26 cm; 69–91 g. Fairly large *Turdoides* babbler, tail not particularly long, with solid blackish hood, plain grey-brown upperparts and spotted breast. Nominative race has lores, crown, ear-coverts, cheek and submoustachial area brownish-black, neck side and mantle to rump olive-tinged pale grey-brown, upperwing and tail dark brown; chin and throat dirty white, upper breast pale greyish-buff with dusky-brown narrow streaking and mottling, lower breast plain or plainer greyish-buff, belly to vent pale buffy brown, creamier on mid-belly; iris straw-yellow to creamy white; bill greenish-black; legs sepia

to brownish-grey. Sexes similar. Juvenile has forehead and face dark brown, reduced mottling below, and bill pale-tipped. Race *stictilaema* has darker and greyer underparts than nominate, throat greyish with narrow blackish streaks and mottling extending up from breast. **Voice.** Chorus song involves accelerating and crescendoing single, scraping “jaaaaaaaa” or double “gwaááá-ga” notes, raspy and chattering, punctuated with staccato “cha-ka-ta” or “ko-kwee”. Calls include continuous grating “ja-ja-ja-ja...” or lower, faster, almost trilling “jaagagagagaga”, used in contact; a loud braying, descending “waaa... haa-haa-haa-haa”; and various short harsh grating notes, e.g. “dzwit”, “dzwuk-dzwuk-dzwuk”, “jwiu”, “jut”.

**Habitat.** Gallery forest, thick clumps of riverine vegetation in open savanna woodland, swampside thickets, bamboo groves, tall scrub and rank grass along streams, parkland, sometimes mangroves; from sea-level in many areas, to c. 1000 m in Cameroon. In denser cover than that favoured by *T. plebejus*.

**Food and Feeding.** Insects and berries found in stomachs. Forages on ground among fallen leaves and debris under tangled vegetation, also among dead banana leaves, etc. Flips litter with bill. Found in small flocks of six or so, sometimes ten, individuals, even when breeding.

**Breeding.** Nov–Dec in Gambia, Jan in Senegal, Sept–Jan in Sierra Leone and Nov–Jul in Mali; fledged dependent young in Jan in Ghana; Jun–Jul and Nov–Dec in Nigeria. Co-operative breeder. Nest a large open cup made of leaves, a few twigs and tendrils, scantily lined with roots and tendrils, placed 1.5 m or more up in head of small oil palm (*Elais*), palm-stump fronds or heavily foliated tree. Clutch 2–3 eggs, dark sky-blue (much darker than blue variety of *T. plebejus*). No other information.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Uncommon to locally common across range. Fairly common and widespread in Gambia, S Senegal, Guinea-Bissau and Guinea, less so in Sierra Leone; widespread in Boucle du Baoulé National Park, in Mali; uncommon in Arli National Park, in Burkina Faso, but frequent around Ouagadougou; uncommon in Ivory Coast except in two areas, one being N Comoé National Park; fairly common and widespread yet patchy in Ghana; common in Togo. Presumed to be widespread in appropriate habitat in N Cameroon; fairly common in S Chad. Present in Dzanga-Ndoki National Park, in Central African Republic.

**Bibliography.** Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Chapin (1953), Cheke & Walsh (1996), David & Gosselin (2002b), Demey & Fishpool (1991), Elgood *et al.* (1994), Fry *et al.* (2000), Gore (1990), Green & Carroll (1991), Grimes (1987), Hall & Moreau (1970), Louette (1981), Morel & Morel (1990), Serie (1950a, 1950b, 1957, 1965).

## 179. Brown Babbler

### *Turdoides plebejus*

**French:** Cratérope brun **German:** Sudandrossling **Spanish:** Turdoide Pardo  
**Other common names:** Sudan (Brown) Babbler

**Taxonomy.** *Icos plebejus* (Cretzschmar, 1828, Kordofan Province, Sudan. Considered to form a superspecies with *T. leucocephala* and *T. jordanii*; sometimes treated as conspecific with former. Proposed race *namensis* (Cameroon and adjacent W Central African Republic) synonymized with *cinerea*. Three subspecies recognized.

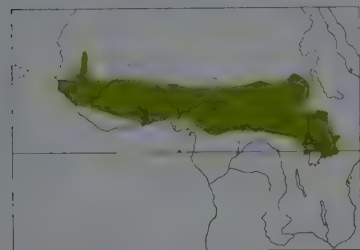


**Subspecies and Distribution.**

*T. p. platycirca* (Swainson, 1837) – S Mauritania and Senegal E to SE Mali, SW Niger border area and W Nigeria.

*T. p. plebejus* (Cretzschmar, 1828) – NE Nigeria E to C & S Sudan.

*T. p. cinerea* (Heuglin, 1856) – SE Nigeria E to S Sudan and SW Ethiopia, S to Cameroon, NE DR Congo, Uganda and W Kenya.



**Descriptive notes.** 22–25 cm; 52–80 g (laying female 88 g). Medium-sized greyish-brown *Turdoides* babbler with black bill, streaky crown, and white-chevroned throat and breast. Nominative race has head scaly grey-brown with blackish dagger-shaped streaks, upperparts mousy grey-brown with paler edges and vague dark streaks, upperwing and tail bronzy brown; lores and area around eye whitish, ear-coverts vaguely streaky greyish-white; upper submoustachial area and chin whitish, throat, lower moustachial area and breast paler grey-brown with subterminal blackish streaks and terminal white tips (giving speckled appearance), belly whitish, flanks, thighs and vent brownish-grey; iris yellow; bill black; legs dusky or slaty black. Sexes similar. Juvenile is plainer and more tawny-brown than adult, particularly on wings and tail, with brown iris. Race *platycirca* has darker crown, greyer face, and chin to breast with less contrasting speckled pattern than nominate; *cinerea* is smaller and darker, with scalier breast pattern. **VOICE.** Song in chorus described as an irritable chuckling, in bursts lasting 5–10 seconds and involving variety of grating babbling cries, “jeeya-jwor jeeya-jwor jeeya-jwor”, “gworrr gworr”, “jeew jeew jeew”, and including chattering like that of a wood-hoopoe (*Phoeniculus*); described also as very loud raucous wooden-sounding chatter, breaking into scolding “k-tchah k-tchah k-tchah...”. Usual contact call a twangy “caa” or “ciau”; harsh reiterated “chuck” repeated for 3–4 seconds in mild anxiety; alarm a harsh chatter reminiscent of that of Mistle Thrush (*Turdus viscivorus*); scolding call a repeated buzzy “chay-o”.

**Habitat.** Open savanna woodland, particularly with *Lophira alata*, parkland, denser parts of open savanna, wooded grassland, bush country scattered with acacias, light forest edge, gallery forest, riparian thickets in drier country, overgrown cultivation, elephant grass (*Pennisetum purpureum*), farmland, parks and gardens; often in rocky areas such as bases of inselbergs where dense scrub grows, and in cold bleak habitats in W Kenya reaches 2300 m; to 1700 m in Uganda.

**Food and Feeding.** Ants (Formicidae), beetles (Coleoptera), mantids, termites (Isoptera), inchworms and, in beeswax, wax-moth larvae; also beeswax itself, berries of *Carissa edulis*, mangoes, papaya and apparently dates of *Phoenix dactylifera*. Opportunistic, taking (e.g.) meat and suet from carcasses hung up in meat sheds. Forages on ground under bushes, scuffling in leaf litter in short hops, bounding strongly when necessary, and moving out on to bare ground, keeping close to cover; glances, pecks, probes and lifts leaves to look underneath them; uses a scythe-like motion of bill in seeking insect prey in drying beeswax. Found in tight-knit family parties of 3–14 individuals, usually 6–8; some pair off during breeding season. Retiring and skulking, yet surreptitiously inquisitive and often noisy. Frequently feeds in mixed-species flocks with diverse birds, and accompanies dwarf mongoose (*Helogale parvula*) parties; chief association with *T. rubiginosa* (in E of range).

**Breeding.** Apr and Aug in Mauritania; Jun, Aug–Oct and Dec–Jan in Gambia; Mar–Jun and Aug in Sierra Leone; Apr–May, Jul and Nov in Ghana; Jun–Jul in Niger; almost all months in Nigeria, specifically Sept–May in N and Dec–Feb and Apr in S; Nov–Jan and Aug–Sept in Sudan; Nov–Mar in DR Congo; nest-building in Jan and eggs Apr in Uganda; Apr–Sept (mostly May–Aug) and Nov–Jan in C Kenya. Co-operative breeder; mating system unknown, but evidence suggests that two females often lay in one nest. Nest a large, fairly shallow cup made of rootlets, grasses, straw, sticks and leaves, lined with rootlets, fine grasses or other fine materials, placed 0.75–5.5 m up in thick (usually thorny) bush, low shrub, creeper-clad acacia or a small tree (*Tarchonanthus*, *Euclea*, *Rhus*, *Carissa*, *Olea*); once in deserted nest of Senegal Coucal (*Centropus senegalensis*). Clutch 2–4 eggs (usually 3 in W Africa), deep greenish-blue to bright salmon-pink, pale mauve or mauvish to grey-blue (colour varying both between and within clutches); no information on incubation and nestling periods; chicks leave nest early. Nests parasitized by Levaillant’s Cuckoo (*Clamator levaillantii*) in Sudan and W Africa; probably also E Africa, where groups seem to chase this species.

**Movements.** Mostly resident; some seasonal movement. In C Burkina Faso noted more often in wet season than in dry, suggesting some local rains-related displacements; in Kampala region of Uganda makes local movements, often being erratically absent for weeks or months.

**Status and Conservation.** Not globally threatened. Fairly common to common across range. Widespread and patchily common in Senegal, and common throughout Gambia; present and common in Boucle du Baoulé National Park, in Mali, and fairly common in sahel zone in E Burkina Faso. Widespread in N Ivory Coast, and widespread but local in Ghana: common throughout Togo and Benin. Common throughout savanna zone in Nigeria, commonest towards Niger border; present in Parc du “W”, in Niger. Common in S Sudan in low-lying areas. Frequent to locally common in Ethiopia, Uganda and Kenya. In Uganda, common in gardens and parks in Kampala.

**Bibliography.** Bannerman (1951, 1953), Barlow *et al.* (1997), Borrow & Demei (2001), Britton (1980), Butynski & Kalina (1993), Carswell *et al.* (2005), Cave & Macdonald (1955), Chapin (1953), Cheke & Walsh (1996), David & Gosselin (2002b), Elgood *et al.* (1994), Fry *et al.* (2000), Giraudoux *et al.* (1988), Gore (1990), Grimes (1987), Hall & Moreau (1970), Jackson & Selater (1938), Lewis & Pomeroy (1989), Louette (1981), Moore (1984), Morel & Morel (1990), Nikolaus (1987), Serle (1938, 1957, 1977), Short & Horne (2006), Stevenson & Fanshawe (2002), Urban & Brown (1971), Vestergaard & Kirkeby (1980), Wilson & Wilson (1994), Zimmerman *et al.* (1996)

## 180. White-headed Babbler

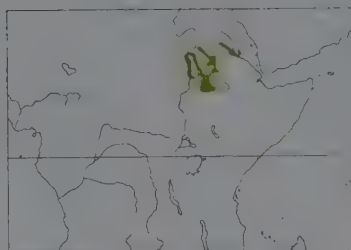
### *Turdoides leucocephala*

**French:** Cratérope à tête blanche **German:** Weißkopfdrossling **Spanish:** Turdoide Cabeciblanco  
**Other common names:** Cretzschmar’s Babbler

**Taxonomy.** *Turdoides leucocephala* Cretzschmar, 1826, Sennar = Blue Nile Province, Sudan. Considered to form a superspecies with *T. plebejus* and *T. jardineii*; sometimes treated as conspecific with one or other. Monotypic.

**Distribution.** E Sudan, NW Ethiopia and NW Eritrea.

**Descriptive notes.** 22–25 cm. Medium-sized greyish-brown *Turdoides* babbler with white head and black bill. Head and chin are off-white, cleanly defined from nape and throat, but with blackish bare skin from lores to around and behind eye, and ear-coverts appearing greyer owing to thinness of white feathers over black skin; plain pale greyish-brown upperparts, slightly paler on rump, upperwing and tail brown, tail darker distally; neck side grey-brown, throat and upper breast grey-



**Food and Feeding.** Only “insects” reported. Lives in parties of 5–6 individuals, occasionally up to twelve together.

**Breeding.** May–Jun in Ethiopia. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon to fairly common in Sudan; frequent in Ethiopia and Eritrea.

**Bibliography.** Cave & Macdonald (1955), Cheesman & Selater (1935), Cretzschmar (1826), David & Gosselin (2002b), Fry *et al.* (2000), Hall & Moreau (1970), Mackworth-Praed & Grant (1960), Neumann (1904), Nikolaus (1987), Reichenow (1905), Urban & Brown (1971), Witherby (1901).

## 181. Arrow-marked Babbler

### *Turdoides jardineii*

**French:** Cratérope fléché **German:** Braundrossling **Spanish:** Turdoide de Jardine  
**Other common names:** Arrow/Jardine’s Babbler

**Taxonomy.** *Crateropus Jardineii* A. Smith, 1836, banks of rivers beyond Kurrichane, north-western Transvaal, South Africa.

Considered to form a superspecies with *T. plebejus* and *T. leucocephala*; sometimes treated as conspecific with latter. Race *convergens* sometimes subsumed in nominate. Proposed race *kikuyuensis* (SW Kenya and adjacent N Tanzania) merged with *emini*, and *natalensis* (S Mozambique S to Lesotho) included in nominate. Seven subspecies recognized.

**Subspecies and Distribution.**

*T. j. hyposticta* (Cabanis & Reichenow, 1877) – S Gabon, S PR Congo, SW DR Congo and NW Angola.

*T. j. emini* (Neumann, 1904) – SW & S Uganda and SW Kenya S to E DR Congo and NW & N Tanzania.

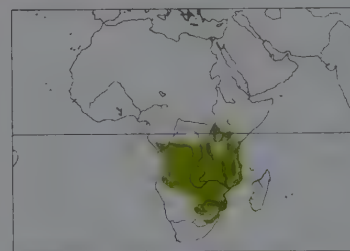
*T. j. tanganyicae* (Reichenow, 1886) – SE DR Congo and NC & NE Zambia.

*T. j. kirkii* (Sharpe, 1876) – SE Kenya, C, E & SE Tanzania, NE (E part) Zambia, Malawi and N & C Mozambique.

*T. j. tamalakani* Meyer de Schauensee, 1932 – WC & S Angola E to extreme SW Zambia, NE Namibia and N Botswana.

*T. j. convergens* Clancey, 1958 – N & E Botswana, Zimbabwe (except far N), C Mozambique and coastal NE South Africa.

*T. j. jardineii* (A. Smith, 1836) – SE Botswana E to S Mozambique, S to N & NE South Africa, Swaziland and NE Lesotho.



**Descriptive notes.** 22–25 cm; 56–85 g. Medium-sized *Turdoides* babbler, dull brownish-grey above, paler below, with distinctive pointed white tips of throat and breast feathers. Nominative race has narrow pointed crown feathers with brownish-black dagger-shaped centres and dull grey-buff edges, shifting to whitish-tipped soft-edged brown and grey-buff feathering on neck side and upperparts, paler and plainer rump, dark brown upperwing and blackish-brown tail; feathers on superciliary area slightly whiter than on crown, lores blackish, ear-coverts, cheek and submoustachial area greyish-brown with narrow white tips; chin to

upper belly brownish-ashy with elongate pointed (spike-like) white tips, lower belly buffish with barely noticeable white shaft streaks; iris scarlet to crimson, inner ring orange to bright yellow (sometimes reversed); bill black; legs brown to dark slate. Sexes similar. Juvenile is much plainer than adult, with no arrow-shaped marks on chest, iris dark brown. Race *hyposticta* is small and grey-headed, with greatly reduced white tips of breast feathers; *tanganyicae* has rather plain blackish crown and face well demarcated from rufescent-tinged plain olive-brown upperparts, underparts as nominate but breast less grey (more concolorous with lower underparts), white tips much narrower and vaguely yellowish-tinged; *emini* is like nominate, but feathers of head overall blacker, head side browner, underparts as previous but shape of tips mid-way towards nominate; *kirkii* is like last, but browner above, notably on neck side, crown feathers less pointed and less black, breast greyer (not so much as in nominate) and arrow marks whiter and narrower; *tamakani* resembles previous, but greyer above, lower underparts colder brown; *convergens* is more buffy olive below than nominate, more streaked on flanks and vent. **VOICE.** Chorus song a harsh nasal chatter, “ra-ra-ra-ra-ra” or “scurr-urr-urr-urr-urr-urr”, usually begun by 1–2 birds calling softly, taken up by others and rising to grating, whirring crescendo and dying away, often a few birds giving low conversational “kuk” and “jigga” notes before new chorus begins. Also a harsh “chak-chak-chak” and “kaa-kaa-kaa” like distant call of Rook (*Corvus frugilegus*); loud “chow-chow-chow-chow...”, often by several birds together.

**Habitat.** Dense thickets in higher-rainfall bush and tree savanna, open woodland underbrush, dry riverine forest edge and reedbeds, bush clumps on termittaria, thorny brush on rocky ground with rank grass, abandoned cultivation in woodland, regenerating bushy growth at edges of cultivation, overgrown abandoned fields, exotic plantations; in N South Africa habitat dominated by tamboti (*Sporobolus africanus*) on sparse grass, or by acacias on extensive grass cover; in Zimbabwe found in open soft woodland with bushes, shrubs and secondary growth, often along watercourses. Occurs at up to 1675 m, occasionally 1830 m; to 2315 m in Rwanda, 2050 m in Malawi.

**Food and Feeding.** Mostly invertebrates up to 35 mm long, including termites (Isoptera), ants (Formicidae), bush-crickets and grasshoppers (Orthoptera), moths and caterpillars (Lepidoptera), beetles (Coleoptera), dipteran flies and their larvae (including tsetse fly) and grubs, also spiders



and sun-spiders (Solitugae), and snails; also lizards; also seeds, fruit including loquats (*Eriobotrya japonica*) and palm nuts (*Elaeis guineensis*), and nectar (e.g. of *Aloe*). Larger food items such as certain fruits are held in foot while being eaten. Recorded as coming to garden birdtable, apparently for seeds. Nestlings fed mainly with insects: of 148 food items, 28% grasshoppers, 20% caterpillars. Forages on ground and in lower bushes and undergrowth, fossicking in leaf litter and creeping through lower branches. Usually in parties of 4–8 individuals, range 3–15 (mean 6), even during breeding season. May form mixed parties with *T. hartlaubii* where ranges overlap; in Mozambique often associates with Terrestrial Brownbul (*Phyllastrephus terrestris*).

**Breeding.** Mar–May and Aug–Oct in Uganda; mainly Sept–May in Tanzania and Zambia; Sept–Jul (mainly Oct) in Malawi and Sept–Dec in Mozambique; in all months (mainly Sept–Nov) in Zimbabwe, May–Aug–Sept and Nov–Dec in Angola and Oct–Mar (mainly Nov–Jan) in Botswana; Oct–Mar in KwaZulu-Natal, and in all months (peak Sept–Apr) elsewhere in South Africa; groups make two or three nesting attempts per breeding season. Co-operative breeder, but not known if more than one female provides clutch; at one site in South Africa, territories averaged 37 ha (range 10.5–63.5 ha), larger groups defending larger areas. Nest, built by all group members, a bulky open bowl made of dry flower stems, coarse grass, pieces of reed, roots, twigs, dead or decayed leaves and leaf fronds, lined with fibres, rootlets and tendons, placed 0.5–7 m up in tree, hedge, floian in overhanging branches along rivers, reed tangle, thick bush, creeper tangle around dead stump or tree cavity; old nest of another species sometimes used; new nest built for each breeding attempt. Clutch 2–8 eggs (usually 3), glossy pale greenish-blue or deep turquoise-blue; incubation by all members of group, period variable, 13–17 days; chicks fed by parents and helpers, immature helpers tending to provide less feeding, nestling period 18–21 days (shortest when group larger). Significant brood parasitism (7.8% of nests) by Levaiant's Cuckoo (*Clamator levaillantii*). Of 13 nests, only three successful; only 8 of 44 eggs resulted in fledging success (uncorrelated with group or territory size).

**Movements.** Resident; some local displacements. In Uganda, recorded only Jun–Aug in W Nile region; occasional vagrancy reported, e.g. W to R Cunene, in NW Namibia.

**Status and Conservation.** Not globally threatened. Locally common over much of range, and adaptable to habitats partly influenced by man. Often common in Uganda, where present in Bwindi Impenetrable Forest National Park and Kyambura Wildlife Reserve; locally common in SW Kenya. Uncommon and local in S Gabon and PR Congo; widespread but often uncommon in savannas of S DR Congo; common and widespread in Zambia and in Malawi (in latter common below 1700 m). Common and widespread in Sul do Save, in Mozambique, where national population estimated at more than 20,000 individuals. Fairly common to locally very common in Botswana; common and widespread in Zimbabwe below 1300 m. Common and widespread in NE South Africa, where density in broadleaf *Burkea africana* woodland in Limpopo Province 8 birds/km<sup>2</sup>, and common in Kruger National Park.

**Bibliography.** Backshall (1993), Barry (1998), Benson (1953), Benson & Benson (1977), Benson & Irwin (1967), Benson & White (1957), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Brown (1969), Brown & Britton (1980), Carswell *et al.* (2005), Chapin (1953), Clancey (1971, 1996b), Clark & Clarke (1985), Cooper, J. (1970), David & Gosselin (2002b), Dean (2000), Dowsett-Lemaire (2006), Dowsett-Lemaire & Dowsett (2006), Fry & Hosken (1983), Fry *et al.* (2000), Gibson (1979), Ginn (1993), Ginn *et al.* (1989), Gordon (1995), Hall & Moreau (1970), Harrison *et al.* (1997), Irwin (1981), Jackson & Slater (1938), Jones (1985, 1992), Lewis & Pomeroy (1989), McKelvey (1980), McLachlan & Liversidge (1978), Meier (1988), Monadjem (1993, 1995), Monadjem *et al.* (1994, 1995), Mortimer (1975, 1976), Newman (1989), Newton-Howes & Newton-Howes (1969), Parker (1999), Payne & Payne (1967), Penry (1994), Plumb (1979), Slater & Moreau (1932), Skinner (1995), Stevenson & Fanshawe (2002), Steyn (1973), Steyn & Howells (1975), Vernon (1976, 1982), Vincent, A.W. (1947), Vincent, J. (1935), White & Winterbottom (1949), Winterbottom (1939), Zimmerman *et al.* (1996).

## 182. Scaly Babbler

### *Turdoides squamulata*

**French:** Cratérope maillé **German:** Schwarzkopfdrossling **Spanish:** Turdoide Escamado  
**Other common names:** Dark-billed Scaly Babbler, Squamulated Babbler

**Taxonomy.** *Crateropus squamulatus* Shelley, 1884, Mombasa, Kenya.

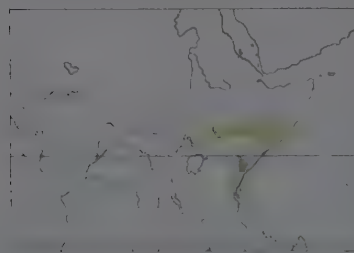
Has been thought to form a superspecies with *T. sharpei* and *T. hypoleuca*, possibly including also *T. himdei*. Birds from R Webbe Gestro, in S Ethiopia, thought to represent an undescribed race, and those from S Ethiopia–NE Kenya border region (Lak Bor watercourse, R Daua) another such; in each case, however, the possibility of hybrid origin evidently not yet excluded (R Webbe Gestro birds uniform brown above, brownish-white below, iris red; Lak Bor birds intermediate between *jubaensis* and *caroliniae* in extent of white on head). Three subspecies currently recognized.

#### Subspecies and Distribution.

*T. s. caroliniae* Ash, 1981 – SE Ethiopia and adjacent SC Somalia (R Shabeelle).

*T. s. jubaensis* van Someren, 1931 – S Ethiopia and adjacent S Somalia (R Jubba).

*T. s. squamulata* (Shelley, 1884) – extreme S Somalia, SE Kenya and adjacent NE Tanzania.



**Descriptive notes.** 22–23 cm; 55–85 g. Smallish *Turdoides* babbler with grey-scaled blackish head and white-scaled greyish breast, orange eye. Male of nominate race has crown brownish-black with narrow greyish-buff scaling, shading to greyish-brown nape and neck side with pale grey, less contrasting scaling; upperparts mouse-grey, dark brown upperwing and tail; face (lores, cheek, submoustachial area and ear-coverts) blackish-brown; pale ashy brown below, narrow whitish scaling from chin to breast, with flanks and vent warmer brown; iris orange-yellow; bill black; legs brownish-slate. Female is as male, but iris has bright yellow inner ring. Juvenile is paler and tawnier than adult, unscaled, with a white, streaked throat and dark iris. Race *caroliniae* has white over forehead, face and throat; *jubaensis* is paler olive-grey above, ear-coverts not dark greyish, showing white only on mid-throat. Voice. Chorus song "poo-poo-poo-poo...", reportedly one of the most grating and toneless sounds made by any passerine. Groups maintain continuous rasping noise that has peculiar undulating quality. Calls include harsh "chak", "chik" and "chuduk" notes, more explosive "spik" notes, also a repeated "chwik" and throaty "wuk-a-ha, wuk-a-ha..." or "ti-yor ti-yor ti-yor...".

**Habitat.** Dense coastal bush, woodland and undergrowth, thickets along rivers, scrub, to 500 m in Kenya.  
**Food and Feeding.** No information on diet; presumably mainly invertebrates, berries and seeds. Occurs in skulking groups of up to five individuals.  
**Breeding.** Apr in Kenya; nest-building in Oct in Somalia; Jul–Aug in Ethiopia. Eggs pale blue. No other information.  
**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common within often circumscribed habitat along rivers in Somalia; race *caroliniae* at risk from habitat deterioration. Locally common in Kenya.

**Bibliography.** Ash (1981), Ash & Miskell (1983, 1990), Britton (1980), Brown & Britton (1980), Clancey (1984), David & Gosselin (2002b), Fry *et al.* (2000), Jackson & Slater (1938), Lewis & Pomeroy (1989), Stevenson & Fanshawe (2002), Urban & Brown (1971), Wood (1989), Zimmerman *et al.* (1996).

## 183. Northern White-rumped Babbler

### *Turdoides leucopygia*

**French:** Cratérope à croupion blanc **German:** Weißbürdzrossling **Spanish:** Turdoide Culiblanco

**Other common names:** Abyssinian/White-rumped Babbler

**Taxonomy.** *Ixos leucopygius* Rüppell, 1837, central forest region along the coast of north Ethiopia. May form a superspecies with *T. hartlaubii*, perhaps including also *T. melanops* and *T. sharpei*; often treated as conspecific with first-named. Proposed race *clarkei* (from R Baro region of extreme SW Ethiopia) merged with *omoensis*. Five subspecies recognized.

#### Subspecies and Distribution.

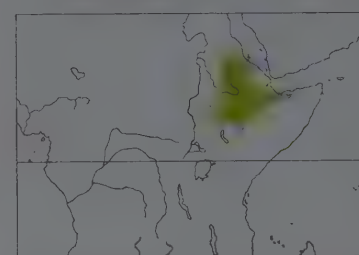
*T. l. leucopygia* (Rüppell, 1837) – C Eritrea and adjacent N Ethiopia.

*T. l. limbata* (Rüppell, 1845) – SW Eritrea and immediately adjacent E Sudan S to C Ethiopia.

*T. l. smithii* (Sharpe, 1895) – EC Ethiopia R to NW Somalia.

*T. l. lacuum* (Neumann, 1903) – SC Ethiopia.

*T. l. omoensis* (Neumann, 1903) – SE Sudan and adjacent SW Ethiopia.



**Descriptive notes.** 25–27 cm; 63–93 g. Medium-sized cold grey-brown *Turdoides* babbler with scaly breast, white lower belly and white rump; plumage rather variable. Nominative race has crown greyish-white, well demarcated from grey-tinged cold brown upperparts, white rump, dark brown upperwing and darker brown tail; supercilium buff-tinged white, face (lores, cheek, submoustachial area and ear-coverts) dirty white; chin whitish, throat and neck side to mid-belly cold grey-brown with darker sub-terminal and very narrow whitish-grey terminal scaling, shading on rest of underparts to white; iris red with yellow inner ring; bill black; legs slaty grey. Sexes similar. Juvenile is duller than adult, with brownish crown rather paler than mantle, whitish face and chin. Race *limbata* has blackish-grey crown with silvery-grey scaling, forehead white, face and chin white; *smithii* has whole crown scaled dark grey and silvery, face dirty silvery grey, chin dusky and broader whitish scaling there and to upper belly; *lacuum* is like previous, but with dusky-grey lores, cheeks, submoustachial region and throat, buffier lower flanks and rump; *omoensis* is like last, but lores, cheeks and submoustachial area plainer blackish-grey, throat less grey, more like breast. Voice. Very noisy. Chorus song of harsh chattering calls given. Calls also harsh and scolding.

**Habitat.** Open stony terrain in hilly areas with light woodland, thick scrub on juniper-clad hills, scrub and dense second growth bordering evergreen forest, trees along rivers, scattered thickets, reedbeds, and farmlands; generally at 1250–2450 m, but much lower in Eritrea (not to coastal plains).  
**Food and Feeding.** No information on diet; presumably mainly invertebrates, berries and seeds. Found in family parties or small flocks of 6–8 individuals, keeping inside cover in bottom of vegetation, but foraging largely on ground.

**Breeding.** Nov–Dec and Feb–Jun in Ethiopia and Aug in Somalia. Nest a large untidy cup made of coarse rootlets, coarse grass, twigs and leaves, lined with fibres, placed 1 m or more up in fork of tree or in middle of thick bush. Clutch 2–4 eggs, rich turquoise-blue. No other information.  
**Movements.** Resident.

**Status and Conservation.** Not globally threatened. In Sudan, uncommon and local in E near Eritrean border, but fairly common in SE. Frequent to common throughout Ethiopian Highlands.

**Bibliography.** Archer & Godman (1961), Ash & Miskell (1983, 1998), Benson (1946), Britton (1980), Cave & Macdonald (1955), Cheesman & Slater (1935), Clancey (1984), David & Gosselin (2002b), Friedmann (1937), Fry *et al.* (2000), Neumann (1906), Nikolaus (1987), Safford *et al.* (1993), Schouteden (1956), Urban & Brown (1971).

## 184. Southern White-rumped Babbler

### *Turdoides hartlaubii*

**French:** Cratérope de Hartlaub **German:** Hartlaubdrossling **Spanish:** Turdoide de Hartlaub  
**Other common names:** Angola/Hartlaub's/White-rumped Babbler

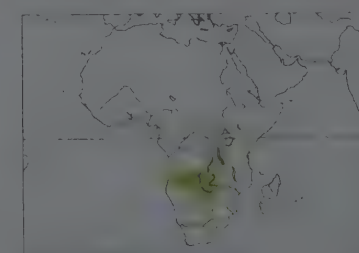
**Taxonomy.** *Crateropus Hartlaubii* Bocage, 1868, Bibala, Namibe, Angola.

May form a superspecies with *T. leucopygia*, perhaps including also *T. melanops* and *T. sharpei*; often treated as conspecific with first-named. Proposed race *ater* (from Rwanda S to NE Zambia and SW Tanzania) considered a synonym of nominate. Two subspecies recognized.

#### Subspecies and Distribution.

*T. h. hartlaubii* (Bocage, 1868) – Rwanda and E & SE DR Congo S to NE & W Zambia and SW Tanzania, and to C & SE Angola and NE Namibia.

*T. h. griseosquamata* Clancey, 1974 – WC Zambia S to N Botswana and extreme W Zimbabwe.



**Descriptive notes.** 23–24 cm; 70–92 g. Medium-sized brownish-grey *Turdoides* babbler with pale scaling on head to mantle and throat, white rump, and short stout bill. Nominative race has crown and neck dark brown with greenish-white scaling, frostier white on blacker, blade-centred feathers of forehead, mantle to back dark brown with a few vague pale brown scales, lower rump whitish, upperwing and tail dark brown, lores blackish, supercilium area as crown but with fringes whiter, ear-coverts dark grey-brown with some buff flecking, cheek dark brown with pale greyish fringes; chin to breast mid-brown with vague dark shaft streaking, narrow white fringes, belly mid-brown with buffy-white edges (forming vague long



streaks), thighs and vent buffy grey; underwing and axillaries cinnamon-buff; iris orange-red to crimson, often yellow inner ring; bill black; legs brownish-grey to dark brown. Sexes similar, female may be less brown on throat. Juvenile is much paler on throat and breast, paler generally and less boldly marked than adult, with dark iris. Race *griseosquamata* is paler and more olive-brown above than nominate, with paler and greyer feather fringes, paler below, with finer streaking on flanks, whiter belly and undertail-coverts. Voice. Very noisy. Chorus song a raucous high-pitched babbling "kwekwekwekwekwekwek...", "cheeka-cheeka-cheeka-cheeka..." or petulant nasal "papapapapapapapapapap...", very similar to that of *T. melanops* but slightly higher-pitched, more pinched and nasal. Various harsh, shrill, nasal and often petulant-sounding calls, including "chaaa", "chi-waaaya", "cheeya", "jik" and "jeeyeeyee".

**Habitat.** Patches of dense scrub between woodland and drainage lines, fringes of *Acacia polyacantha* gallery woodland, riverine-forest edge, thickets on termitaria, gardens, marshy valleys with clumps of bushes and tall grass, sometimes reedbeds and papyrus swamps; to 1650 m in DRCongo, and occurring at 1550–2150 m in Tanzania.

**Food and Feeding.** Mainly invertebrates. Frequents middle and lower strata of vegetation, foraging mainly on ground in open. Found in pairs and in parties of 5–15 individuals (average 8), sometimes up to 20 together; often in mixed flocks with *T. jerdoni*.

**Breeding.** Jul–Oct in Angola; bird in breeding condition in Feb in DRCongo; Mar in Tanzania, Apr–May and Oct–Feb in Zambia, and Apr, Aug, Oct and Dec in Botswana; Oct–May (peak Feb) in Zimbabwe. Breeds co-operatively within permanent territory. Nest an untidy bowl of coarse grasses, dry leaves and thin roots, with neat cup lined with fine roots and slender twigs, placed up to 3 m above ground in bush, low tree, tangle of flood debris, or among dense tufts of reeds and sedges. Clutch 2–4 eggs, deep greenish-blue to plain greyish-turquoise; no information on incubation period; nestlings fed by up to four adults, nestling period 18 days in one case. Brood parasitism by Levallant's Cuckoo (*Clamator levallanti*) occurs.

**Movements.** Resident; in Botswana may extend S during rains.

**Status and Conservation.** Not globally threatened. Common in extreme SW Rwanda; abundant on Ruzizi Plain and along shores of L Tanganyika, in Burundi. Locally common in SW Tanzania; widespread in Zambia. Common in Angola. Common to very common in Okavango Basin and various NW river valleys in Botswana; common in Caprivi Strip, in Namibia.

**Bibliography.** Benson & Pitman (1956), Benson & White (1957), Benson *et al.* (1971), Chapin (1953), Clancey (1968, 1974, 1982, 1984, 1985), David & Gosselin (2002b), Dean (2000), Fry *et al.* (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hustler (1997), Irwin (1981), Moyer (1983), Newman (1989), Payne & Payne (1967), Penny (1994), Skinner (1995), Stevenson & Fanshawe (2002), Traylor (1965), White & Winterbottom (1949), Winterbottom (1939), Wyndham (1948).

## 185. Hinde's Pied Babbler

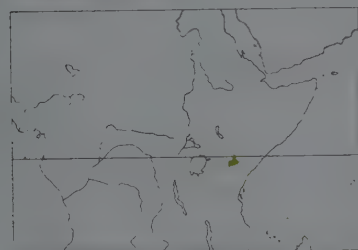
### *Turdoides hindei*

**French:** Cratéope de Hinde **German:** Hindedrossling **Spanish:** Turdoide de Hinde  
**Other common names:** Hinde's Babbler

**Taxonomy.** *Crateropus hindei* Sharpe, 1900, Athi River, Kenya.

Has been thought possibly to be part of a superspecies with *T. sharpei*, *T. squamulata* and *T. hypoleuca*. Monotypic.

**Distribution.** SC Kenya.



**Descriptive notes.** 20–23 cm; 58–77 g. Smallish piebald *Turdoides* babbler, dark brown with extensive white scaling, buff flanks and white belly; no two individuals quite alike, owing to much partial albinism in which white tips can occur (asymmetrically) on wings and tail, and rufous markings may appear anywhere on head and body. Typically, has sooty-brown head, breast, mantle and lesser upwing-coverts thickly covered with variable-width white scales, rump rufous or same as back but heavily tinged rufous, upperwing rufescent dark brown, tail dark brown, belly creamy white, thighs dark grey-brown, flanks and vent buffy

rufous to rufous; iris red; bill black; legs horn. Sexes similar. Juvenile has browner, less bronzy wings and tail, greyish iris. Voice. Chorus song a noisy chattering "rukakakakakaka...", like that of *T. hypoleuca* but faster, individual birds calling "ruka" before and after; variation is a grating "ta-jaaa", growing in chorus to protracted screeching "d'jaaaaaay". Calls include repeated loud downslurred bray, "dayoo" (similar to that of *T. squamulata*), rambling "chare-chare-chare", chattering "chirr-chirr...", "cherak-chwak-chakchakchakchak", with a hiccup-like alarm.

**Habitat.** Thickets and secondary growth with some remaining trees in river valleys, particularly in fallow and abandoned areas where alien *Lantana camara* established, fringes of cultivation with scattered trees and bushy cover, also along bushy streams and gulleys in drier open woodland; feeds in coffee and maize plantations, but territories confined to areas with dense vegetation associated with permanent or seasonal water. Significantly more groups present in areas with more than 3% thicket cover (and breeding success improves with more than 9% cover), but group density levels out at 15–20% cover. Original habitat judged to have been rocky hillsides and valleys with *Combretum*, *Terminalia*, *Croton*, *Cussonia*, *Cassia* and *Commiphora*. At 1070–1700 m.

**Food and Feeding.** No information on diet; presumably mainly invertebrates, berries and seeds. Nestlings observed fed on "dark glutinous mass" brought from under bushes. Found in small flocks of 4–8 individuals throughout year; forages at least part of time on open ground, with sentries.

**Breeding.** Feb, Apr and Aug–Oct. Solitary, co-operative breeder; mean group-territory size 3.75 ha. Nest an open cup made of coarse grass, lined with finer grass. Clutch 2–3 eggs, pale blue; no information on incubation and nestling periods. Brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) reported. In one study, only one of five nesting attempts was successful, the others failing owing to predation or human disturbance.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species; present in Kenyan Mountains EBA. Scarce and very local. Substantial contraction of range in response to agricultural expansion, reported in 1979, appears not to have occurred, although in 2000 a loss of more than 20% of its range was expected. Current range size estimated at 18,800 km<sup>2</sup>, and population judged to be between 2500 and 10,000 mature individuals; this latter estimate based on average density of 2.4 birds/km<sup>2</sup>. Survey of six sites in 2000–2001 produced minimum population figure of 665 birds in 157 groups, with 75% in two intensively farmed sites and 97% in or adjacent to five Important Bird Areas; extrapolation suggested that global population was then 1500–5600 individuals. Clearance and fragmentation of habitat owing to expanding and intensifying farming are major threats; rice irrigation

and dams along R Tana may also have destroyed thickets, while disturbance appears to cause low breeding success and hunting for food causes direct losses in some areas. Three protected areas harbour populations: Mwaa National Reserve, Meru National Park and the small, privately owned Wajee Camp (near Mukurweini), but only c. 8% of total population in these reserves. Restoration of habitat so that thicket cover reaches 10% likely to result in greater productivity in population.

**Bibliography.** Anon. (2006d), Blencowe (1961), Britton (1980), Buichart & Stattersfield (2004), Collar & Stuart (1985), Friedmann (1937), Fry *et al.* (2000), Jackson & Sclater (1938), Kamiti (2003), Lewis (1984), Lewis & Pomeroy (1989), Njoroge & Bennun (1999), Njoroge & Mutinda (1996), Njoroge *et al.* (1998), Plumb (1979), Shaw (1996), Shaw & Musina (2003), Shaw *et al.* (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Turner (1992), Zimmerman *et al.* (1996).

## 186. Northern Pied Babbler

### *Turdoides hypoleuca*

**French:** Cratéope bigarré **German:** Bronzedrossling **Spanish:** Turdoide Pío

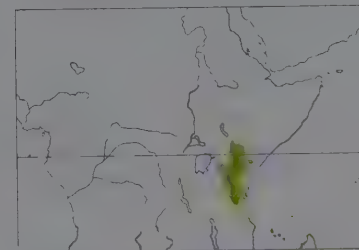
**Taxonomy.** *Crateropus hypoleucus* Cabanis, 1878, Kitui, Kenya.

Has been thought to form a superspecies with *T. sharpei* and *T. squamulata*, possibly including also *T. hindei*. Two subspecies recognized.

**Subspecies and Distribution.**

*T. h. hypoleuca* (Cabanis, 1878) – C & S Kenya S to N Tanzania (Mt Kilimanjaro).

*T. h. rufuensis* (Neumann, 1906) – NE Tanzania.



**Descriptive notes.** 22–25 cm; 67–80 g. Medium-sized *Turdoides* babbler, brown above and white below, with partial or full breastband. Nominata race has crown, nape and mantle plain brown with faint, pale greyish-brown scaling, remaining upperparts, upperwing and tail plain brown, whitish spots on median and lesser wing-coverts; face (lores, superciliary area, cheek and ear-coverts) plain dark brown, neck side, flanks, thighs and partial or complete breastband the same but with faint, pale greyish-brown scaling, remaining underparts (including submoustachial area) white, sometimes with buffy tinge (one individual recorded

with entire underside except throat dingy grey brown); iris creamy white, sometimes pale yellow or straw; bill black; legs dusky. Sexes similar. Juvenile is slightly more olivaceous than adult, streaked on breast, iris dark. Race *rufuensis* is paler and greyer above, with scaling extending onto back, crown more extensively and densely flecked and scaled buffy grey, often also with greyer head side, darker lores, more extensive breastband. Voice. Very noisy. Chorus song a loud "teeya-teeya-teeya", "skare-skare-skare-skare..." or longer "teeyayayayaya", lacking churring quality of F African congeners. Calls include nasal, complaining, slightly downslurred and fading "taaaa" or "yaaaa", insistent "quorr-quorr", and variety of raucous chattering, churring and chuckling notes.

**Habitat.** Middle-elevation bushlands, edges of dry evergreen forest, secondary growth, patches of *Erythrina* and nearby clumps of bushes and trees, scrub, plantations, suburban gardens, areas near human habitation; in Kenya study, groups spend midday in *Lantana* thickets. Generally at 1000–1800 m.

**Food and Feeding.** No information on diet; presumably mainly invertebrates, berries and seeds. Forages mostly on ground under thick cover of bushes, tossing and turning dead leaves and debris in search of prey; in evening, feeds close to roost-site. Found in family parties of 3–5 individuals and larger groups of up to 10–12 (average 8.3) individuals; in small groups during breeding season.

**Breeding.** Feb–Dec (peaks Apr–May and Nov) in Kenya and Nov and Feb in Tanzania. Nest a rough cup of leaves, twigs and coarse dry grasses (one incorporated *Bougainvillea* flowers and dog hair), lined with finer grasses, rootlets and fibres, usually placed 1.5–3.7 m up in thorny bush. Clutch 3–4 eggs, usually 3, rich dark blue, sometimes with faint brown spotting. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Range relatively small. Locally common in Kenya, and a common bird in Nairobi gardens. In Tanzania occurs in three populations: one (around Mt Kilimanjaro) with 50 recorded localities; another (Kilosa) where fairly common, with 23 localities; and third from Usambaras towards Tanga (abundance/localities unreported).

**Bibliography.** Britton (1969, 1980), Brown & Britton (1980), David & Gosselin (2002b), Friedmann (1937), Fry *et al.* (2000), Jackson & Sclater (1938), Lewis & Pomeroy (1989), Njoroge & Mutinda (1996), Njoroge *et al.* (1998), Plumb (1979), Shaw & Musina (2003), van Someren (1939), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

## 187. Southern Pied Babbler

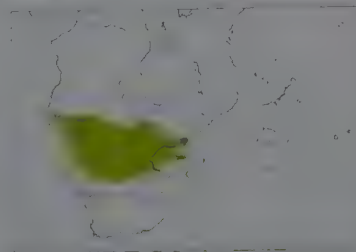
### *Turdoides bicolor*

**French:** Cratéope bicolore **German:** Elsterdrossling **Spanish:** Turdoide Bicolor  
**Other common names:** Bicoloured/Pied Babbler

**Taxonomy.** *Cratopus bicolor* Jardine, 1831, South Africa.

Monotypic.

**Distribution.** N & NE Namibia, Botswana, SW & S Zimbabwe, N & NE South Africa and SW Mozambique.



**Descriptive notes.** 24–25 cm; 63–96 g. Medium-sized white *Turdoides* babbler with black bill, wings and tail. Head and body are pure white, with brownish-black tail and wing, latter with white innermost greater coverts and median and lesser coverts; iris reddish-orange to orange-yellow or golden; bill black; legs black to brown. Sexes similar. Juvenile is olive-brownish, with dark shaft streaks on forehead, ear-coverts ashy brown, paler on lower belly, dark brown wings and blackish tail; starting at 3–4 weeks post-fledging, white feathers acquired gradually over 4–6 months (birds of this age having irregular blotches of brown and

white, looking piebald). Voice. Chorus song involves various harsh but quite high-pitched chattering notes, "cha-cha-cha", "keey-keey-keey", "kawa-kawa-kawa", "kwee kwee kwee kwee" etc.



one bird begins "sk-sk-sk-sk-skerr-skerr-skerra-skerra" or "jajajajijijijeeeyi-jeeeyi-jeeeyi-jeeeyi" and other party-members join in, notes becoming double at height of calling, slowing to "kawäck-kawäck-kawäck...". Calls include various crowing notes; challenge note like that of Green Woodhoopoe (*Phoeniculus purpureus*); adult uses "purr" call to summon independent fledglings to patch of abundant food.

**Habitat.** Semi-arid to arid savanna (avoiding more open areas and more mesic woodlands), often with abundance of corkwood (*Commiphora*) and acacia and sparse covering of grass; also thornveld, dry broadleaf woodland, acacias and bushy undergrowth bordering rivers; low blackthorn (*Acacia mellifera*) woodland in W Botswana, and in taller camelthorn (*Acacia erioloba*) woodland and exotic mesquite (*Prosopis*) in Kalahari. Ranges up to 1200 m in Zimbabwe.

**Food and Feeding.** Insects, including tenebrionid beetles, beetle larvae, caterpillars and moths (Lepidoptera), grasshoppers (Orthoptera), ants (Formicidae), termites (Isoptera), large ticks (Ixodes), sun-spiders (Solifugae), scorpions, small reptiles (burrowing skinks, lizards, grass snakes) and amphibians (frogs); group disturbed from a kudu (*Tragelaphus strepsiceros*) carcass were probably taking maggots. Forages mainly on ground, tossing leaves aside in search of food, digging in soil, searching bases of grass clumps, picking through dung, breaking open termite tunnels, creeping through tangled undergrowth, climbing among thorny twigs and vines; bill often used as dagger to stab prey. Found in groups of up to 15, usually consisting of 6–10 adults and up to three immatures. Frequently forages in company with other bird species, and in particular reported to form associations with Red-billed Buffalo-weaver (*Bubalornis niger*) and Crimson-breasted Shrike (*Laniarius atrococcineus*); at least in Kalahari, also has common association with Fork-tailed Drongo (*Dicrurus adsimilis*). In parts of range close ecological overlap with *T. jardineii* occurs, resulting sometimes in co-existence, sometimes in competition.

**Breeding.** Oct–Apr in Namibia, Sept–May (mainly Oct–Dec) in Botswana and Aug–Jan (mainly Nov) in Zimbabwe; Oct–Jan and Mar in N South Africa; up to five attempts per group per year reported, with at least one young fledged per attempt, intervals between successive clutches 2–12 weeks (rainfall-dependent). Co-operative breeder, with up to twelve helpers at nest; territories in acacia savanna 35–50 ha, but territorial groups may place nests in neighbouring trees. Nest, built by dominant male and female in group, occasionally with help of third bird, over period of up to 26 days, a large, rough, fairly deep open bowl made of long dry stems and thin twigs, neatly lined with hair and fine soft fibres, fine rootlets, fine grasses and similar, placed 1.5–3 m above ground in outer branches or multiple internal fork of thorny bush or tree (typically, *Acacia* or *Ziziphus*); old nest of Wattled Starling (*Creatophora cinerea*) also used; new nest constructed for each breeding attempt (one record of re-use of original nest). Clutch 2–5 eggs, usually 3, very pale bluish-green to whitish; incubation and nestling periods both c. 16 days in one case; young provisioned by all group-members for up to 14 weeks after fledging, but post-fledging dependence sometimes as short as 40 days. Infrequent brood parasitism by Levillant's Cuckoo (*Clamator levaillantii*) occurs.

**Movements.** Resident, but groups may wander in response to local conditions; considered vagrant in Free State, in South Africa.

**Status and Conservation.** Not globally threatened. Locally common. Widespread in N Namibia; common to very common throughout most of Botswana. Widespread in Hwange National Park, in Zimbabwe, but localized elsewhere in country. Locally common in Northern Cape and fairly common in Limpopo Province, in South Africa. Density in acacia savanna 8 birds/km<sup>2</sup>.

**Bibliography.** Allan (2002), Barbour (1972), Clancey (1971), Dowsett & Dowsett-Lemaire (1993), Fry *et al.* (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey *et al.* (2005), Hoesch (1934), Irwin (1981), Lindeque & Kapner (1993), Newman (1989), Peacock (2006), Penry (1994), Radford & Ridley (2006), Ridley (2006), Ridley & Rathani (2007), Skinner (1995), Tyler (2002a, 2002b).

## 188. Bare-cheeked Babbler

### *Turdoides gymnogenys*

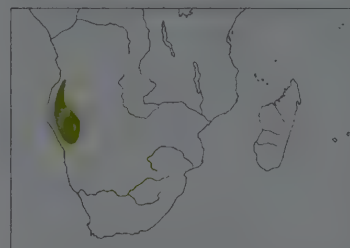
**French:** Cratérope à joues nues **German:** Nacktwangendrossling **Spanish:** Turdoide Caricalvo

**Taxonomy.** *Crateropus gymnogenys* Hartlaub, 1865, Benguela Province, Angola. Two subspecies recognized.

**Subspecies and Distribution.**

*T. g. gymnogenys* (Hartlaub, 1865) – SW Angola.

*T. g. kaokensis* (Roberts, 1937) – NW Namibia.



**Descriptive notes.** 24–25 cm; 65–91 g. Medium-sized *Turdoides* babbler, mid-brown above and white below, with pale greyish crown, black skin on face and buffy-rufous nape and neck sides. Nominative race has crown pale greyish with white and buffy tinges and some small black shaft streaks, shading to pale-scaled buffy rufous on nape and neck sides and to buffy-scaled mid-brown on mantle, plumage slightly darkening posteriorly but with white rump, and dark brown upperwing and tail; lores and supercilium white, bare black skin from bill below eye to ear-coverts (often crossed by strips of white feathers, so appearance as much "bar-cheeked" as "bare-cheeked"); lower face and underparts white, some buffy rufous on flanks (probably not usually visible in field); iris lemon-yellow (sometimes grey-brown in male, whitish or pale yellow in female); bill black; legs dusky grey to brownish-flesh. Sexes similar. Juvenile has slightly stronger greyish-brown crown and less intense buffy-rufous nape and neck sides than adult. Race *kaokensis* is like nominate, but mantle and scapulars slightly paler brown, buffy rufous of neck side, breast side and flanks also paler, smaller bare patch on ear-coverts more broken by thin lines of white feathers. **Voice.** Chorus song a loud chattering "kerrakerrra-kek-kek-kek", very like that of *T. jardineii*, which arises out of continuous low grating "chuk... chuk... chuk..." contact call, also described as a harsh "jeeee-jeeee-jeeee..." or "jaaa-jaaa-jaaa...". Sentinel birds give soft "lull lull lull" call.

**Habitat.** Undergrowth of dry broadleaf riverine woodland, woodland on open plains, thick thorny brush on bare rocky ground, tamarisk and other thickets along seasonal watercourses, rocky semi-wooded hills and slopes. In Namibian study, density highest in riverine habitats.

**Food and Feeding.** Mainly insects and their larvae, including beetles (Coleoptera), caterpillars (mopane worms), termites (Isoptera) and mantids; also some vegetable matter. Forages in pairs or in family groups of 2–11 individuals (mean 6), mainly on ground and in low vegetation, often thereby attracting other species and becoming nucleus of mixed flock, including congeners and such species as shrikes (Laniidae). Turns over leaf litter and probes bases of grass clumps.

**Breeding.** Mainly Nov–Jan (Jul–Jan, also Apr–May) in Namibia. Co-operative breeder; up to twelve birds attending one nest. Nest a loose bulky bowl made of dry grass and herb stems, lined with finer grasses, placed c. 2 m up in multiple fork in tree (e.g. *Terminalia* or *Spirostachys*). Clutch 2–3 eggs, glossy turquoise-green; no information on incubation period; nestling period at least 16 days. Brood parasitism by Levillant's Cuckoo (*Clamator levaillantii*) occurs. Breeding success higher in well-wooded habitat: 0–39 fledged young per adult in densest riverine stands, 0–27 in less dense areas, and 0–16 in least dense areas, success not related to group size.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon in Angola. Uncommon to locally common in Namibia, where range covers 85,000 km<sup>2</sup> and population estimated at 53,170–104,970 individuals; density along watercourses c. 3–6 birds/km, mean distance between neighbouring groups 1–7 km and overall density 0–6 groups/km<sup>2</sup>; present in Etosha National Park. Abundance in any given year related to rainfall, at least in riverine habitats.

**Bibliography.** Clancey (1985, 1989), Dean (2000), Fry *et al.* (2000), Ginn *et al.* (1989), Hall & Moreau (1970), Harrison *et al.* (1997), Hockey *et al.* (2005), Jarvis & Robertson (1999), Robertson *et al.* (1995), Shaw (2001a), Shaw & Shewry (2000), Traylor (1963), Vernon (1982).







## PLATE 14

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *PHYLLANTHUS* Lesson, 1844

#### 189. Capuchin Babbler

##### *Phyllanthus atripennis*

**French:** Phyllanthe capucin **German:** Schwarzflügelimalie **Spanish:** Charlatán Capuchino

**Taxonomy.** *Crateropus atripennis* Swainson, 1837, Senegal.

Race *rubiginosus* is reported to intergrade with *bohndorffi* eastwards from Nigeria towards Central African Republic, in zone where precise distribution is unclear and very local. Central populations formerly known as *haynesi* but this name is a junior synonym of *rubiginosus*. Three subspecies currently recognized.

##### **Subspecies and Distribution.**

*P. a. atripennis* (Swainson, 1837) – Gambia and Senegal S to Liberia.

*P. a. rubiginosus* (Blyth, 1865) – S Ivory Coast E to C & S Nigeria and W Cameroon.

*P. a. bohndorffi* (Sharpe, 1884) – S Central African Republic and NE DR Congo E to SW Uganda.



**Descriptive notes.** 21–24 cm; 75–96 g. Stout, chunky, short-tailed babbler, blackish-maroon with creamy-yellowish bill, grey head and distinctive hoarse calls. Nominative race has crown slaty black centrally with narrow grey edges, shading to grey on superciliary area and nape, grey continuing to neck side, ear-coverts, cheek and chin to upper breast; area around eye with brighter silvery flecks, and area from neck side to breast with vague darker scaling or mottling; adjacent areas (mantle, lower neck side, breast) blackish, shading irregularly to rich maroon on remaining body plumage; upperwing dark brown, tail blackish-brown; iris brown to dark

red-brown; bill creamy to pale yellowish-green; legs olive-green to grey. Sexes similar. Juvenile has dark brown iris. Race *rubiginosus* is brighter reddish-chestnut than nominate, with crown entirely blackish, no blackish on mantle to breast, grey of throat not extending onto breast; *bohndorffi* is like previous but somewhat smaller, with forehead black, whole rest of crown to submoustachial area sealy grey, and chin and throat entirely maroon. Voice. Chorus song an excited raucous cackling mixed with grating trills, “krrrrrr...” or “kekekeke...”, accelerating into piercing squeaks when flock disturbed. A surprisingly musical whistle, pure and downslurred, “whooh whooh” or “hiiiu” or “fweeu”, between normal chattering notes may also be song. Contact calls are little hoarse grunts, “kerk”, “kawk”, “ufufuf” or “augh”, conversational “weeu weeu” and single soft “quack”, in alarm, becomes very noisy, giving harsh notes with variations described as “kaaa”, “kk kk kk” (“cht”), “kaa kaa kaa kaw” and “kiorr-kiorr” or “chrrrrr”.

**Habitat.** Shady undergrowth, thick leafy tangles, dense thickets and lush streamside growth in broadleaf evergreen forest, primary mountain forest, dense secondary forest and secondary growth, forest edge (sometimes bordering cultivation), forest remnants in savanna, wooded gulleys, occasionally savanna woodland; sometimes well-wooded gardens. Keeps to darkest, thickest parts of cover, and very retiring. Lowlands; in Uganda, at 700–900 m in Bwamba but with record at 1700 m in Bwindi.

**Food and Feeding.** Mainly invertebrates, including ants (Formicidae), small beetles (Coleoptera), cockroaches (Mantodea), grasshoppers (Orthoptera), caterpillars, pupae and larvae, millipedes (Diplopoda) and small snails; also small amphibians, and seeds. Forages in lower and middle sto-

reys, to 3–4 m, and on ground. Follows driver ants (*Dorylus*), and seen to follow group of foraging long-nosed cusimanses (*Crassarchus obscurus*) for several hours. Found in noisy groups of 4–12 (usually 5–7) individuals, sometimes in pairs; associates with other species, including *Turdoides reinwardtii*, in mixed foraging flocks.

**Breeding.** Nest-building in Jun and food-carrying in Nov in Gambia; birds in breeding condition in Mar and Jun–Aug in Liberia; Nov–Feb in Sierra Leone; Jan–Feb and Jun–Oct (probably all year) in DR Congo; breeding-condition bird in Oct in Uganda. Nest a large, untidy cup of green moss and dead leaves, lined with pliable hard rootlets, placed 3–4.5 m up in sapling, bush or creeper-laden oil palm (*Elaeis*). Clutch 2 eggs, pale blue. No information on incubation and nestling periods. Brood parasitism by Levallant’s Cuckoo (*Clamator levallantii*) inferred from presence of fledgling cuckoo in group.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally uncommon to fairly common but local across range. Rare but evidently resident in Gambia; fairly common in Senegal in SW; frequent in coastal Guinea-Bissau; frequent on Freetown Peninsula, in Sierra Leone; fairly common near coast and in highlands in N Liberia; frequent at Mt Nimba, in Taï Forest National Park and along N gallery forest but otherwise scarce in Ivory Coast; fairly common and widespread in S Ghana; rare in Benin. In Nigeria, frequent in SW but rare and local from there E to Central African Republic, with only two records in Cameroon before 1980. Widespread in Uele, Aruwimi and Ituri districts of DR Congo; fairly common in Bwamba lowlands and recorded from Bwindi-Impenetrable Forest National Park, in Uganda. Earlier reports of this species from Mali, including movement N in rains, now considered erroneous. Easily netted and snared; groups can often be taken for food by local people.

**Bibliography.** Bannerman (1951, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1980), Carswell *et al.* (2005), Chapin (1953), Cheke & Walsh (1996), Claffey (1995), Colston & Curry-Lindahl (1986), Dowsett-Lemaire & Dowsett (2005), Elgood *et al.* (1994), Field (1974), Fry *et al.* (2000), Gatter (1997), Gore (1990), Grimes (1987), Hall & Moreau (1970), Hayman *et al.* (1995), Louette (1981), Morel & Morel (1990), Stevenson & Fanshawe (2002), Wacher (1993).

### Genus *KUPEORNIS* Serle, 1949

#### 190. White-throated Mountain Babbler

##### *Kupeornis gilberti*

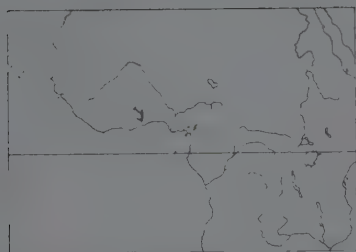
**French:** Phyllanthe à gorge blanche **German:** Weißkehltimalie **Spanish:** Charlatán Goliblanco

**Taxonomy.** *Kupeornis gilberti* Serle, 1949, Kupé Mountain, Cameroon.

Genus has been merged with *Liottilus*, but perhaps closer to *Phyllanthus*; differs from latter in smaller and weaker bill with relatively broader base (less laterally compressed); more slit-like nostrils (as *Turdoides*), and more slender feet. Monotypic.

**Distribution.** SE Nigeria (Obodu Plateau) and SW Cameroon.

**Descriptive notes.** 21–23 cm; 64 g. Large brown-and-white forest babbler with olivaceous brown body and white face and breast. Crown is dull chestnut, clear-cutting on nape to bronzy olive-brown upperparts and upperwing, becoming rufescent on rump and chestnut on uppertail-coverts; tail very dark olive-brown with rufescent outer fringes; face (lores, supercilium, cheek, ear-coverts and submoustachial area) white with pale vinous-chestnut tinge, chin to mid-breast pure white, remaining underparts olive-tinged dull chestnut-brown, undertail-coverts richer, iris greyish-white to pale bluish-grey; bill pale brown, dirty white lower mandible; legs greenish-grey or bluish-grey.



Sexes similar. Juvenile has entire ear-coverts, cheeks, chin and throat brown, with only 2–3 white feathers; immature male has white throat and ear-coverts with sparse brown spotting, more rufous underparts. VOICE. Call a harsh explosive “chak”, “chook” or “chrook”, usually given singly but occasionally up to four times in rapid succession; also soft “kion”. Flocks often make harsh concerted chatter.

**Habitat.** Primary montane forest with high rainfall apparently crucial, but seen in mature secondary growth, including scrubby but mossy *Maesa lanceolata* forest 10 m tall, and also in conifer trees around cattle-ranch build-

ings on Obudu Plateau; found at 950–2135 m, but distribution (particularly altitude) seems well correlated with that of thick epiphytic moss.

**Food and Feeding.** Mainly insectivorous. Travels through forest in highly active, excitable and vocal flocks of up to twelve individuals, occasionally up to 20. Parties advance slowly through canopy and middle stratum, occasionally descending to undergrowth. Searches for food among moss, epiphytes and crevices in bark, often perching upside-down. Often associates with flocks of Grey-headed Greenbul (*Phyllastrephus poliocephalus*) and other species. Behaviour said to resemble that of *Phyllanthus atripennis*.

**Breeding.** Apr–Jan. Nest a large untidy cup of moss and bits of fern, placed c. 10 m above ground at base of branch against trunk, among strangler figs in large tree. No other information.

**Movements.** Resident.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in Cameroon Mountains EBA. Although the species has recently been found at several new sites, its total range is very small and its montane-forest habitat is threatened and continues to decline in extent and quality at some localities. Estimated range 1990 km<sup>2</sup>, within which locally fairly common to common. Common on Obudu Plateau and, in 1999, found to be very common on Mt Manenguba. The two most important sites, both in Cameroon, are Bakossi Mts and Rumpi Hills, because of the area of suitable forest remaining; in 1998, population in Bakossi estimated at several thousand individuals. Undisturbed forest throughout its range is under pressure from exploitation for timber and firewood, intensive grazing, fire and clearance for agriculture. There is an ongoing conservation and development project at Mt Kupé, but the forest still has no legal protection and there has been a slow extension of farmland on N slopes. Forests of Bakossi are still waiting to be classified, probably partly as forest reserves (open to timber concessions) and partly as protected areas. The Banyang Mbo Wildlife Sanctuary is the focus of a major conservation programme. A small area of montane forest is protected on the Obudu Plateau.

**Bibliography.** Anon. (2006d), Bannerman (1951, 1953), Borrow & Demei (2001), Butchart & Stattersfield (2004), Eisenraut (1973), Elgood (1965), Elgood *et al.* (1994), Fry *et al.* (2000), Louette (1981), Rodewald *et al.* (1994), Serle (1949, 1950b, 1950c, 1954, 1957, 1965), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart (1986), Vande weghe (1988).

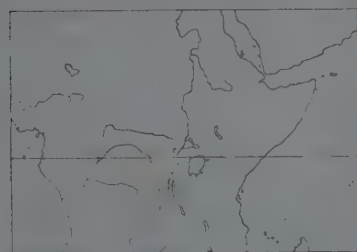
## 191. Red-collared Mountain Babbler

### *Kupeornis rufocinctus*

**French:** Phyllanthie à collier roux **German:** Rostbandtimalie **Spanish:** Charlatán Cuellirrojo  
**Other common names:** Red-collared Babbler/Blackcap

**Taxonomy.** *Lioptilus rufocinctus* Rothschild, 1908, Ruge Forest, south-western Rwanda. Genus has been merged with *Lioptilus*, but perhaps closer to *Phyllanthus*; differs from latter in smaller and weaker bill with relatively broader base (less laterally compressed), more slit-like nostrils (as *Turdoides*), and more slender feet. Present species forms a superspecies with *K. chapini*, and sometimes considered conspecific. Monotypic.

**Distribution.** E DR Congo, SW Uganda, Rwanda and N Burundi.



**Descriptive notes.** 19–20 cm. Sociable, noisy, tail-flicking dull olive-brown babbler with dusky cap, wings and tail, rufous neck, breast and rump, and whitish eye. Crown, lores and superciliary area are black, upper submoustachial streak blackish, upper malar area and chin buffy, and nape, neck side and ear-coverts to throat and breast rufous; upperparts and lower underparts olive-brown, except for rufous rump and vent; upperwing and tail blackish-brown; iris yellowish-white or pale straw-yellow; bill whitish-brown, dusky around nostrils; legs pale grey. Sexes similar. Juvenile has dark eye. VOICE. Call harsh and

chattering, often in chorus, similar to that of *Turdoides* although quieter and rather rustling; also written plainly as “chuck”.

**Habitat.** Broadleaf evergreen forest, preferring very moist areas where trees covered in mossy epiphytes, also dense thickets in bamboo forest; at 1500–3200 m.

**Food and Feeding.** Insects; occasionally small fruits. Gregarious, occurring in groups of 3–15 individuals which forage together on trunks and branches of trees, probing aggressively among large masses of epiphytes, often hanging head-down, tail constantly moved up and down. Sometimes in bird waves, most commonly with White-headed Woodhoopoe (*Phoeniculus bollei*).

**Breeding.** Nest-building in Apr–May, copulation seen May–Jul and dependent young Jun–Aug in Rwanda. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Albertine Rift Mountains EBA. In favourable habitat, can occur at high density, each group having home range of 20–25 ha. Known from only a few sites, and the level of threat to these, particularly as a result of clearance for shifting agriculture, means that this species’ long-term future is far from secure.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Chapin (1953), Dowsett-Lemaire (1990), Fry *et al.* (2000), Prigogine (1960, 1964), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Vande weghe (1988).

## 192. Chapin’s Mountain Babbler

### *Kupeornis chapini*

**French:** Phyllanthie de Chapin **German:** Chapintimalie **Spanish:** Charlatán de Chapin  
**Other common names:** Chapin’s Babbler

**Taxonomy.** *Kupeornis chapini* Schouteden, 1949, Mongbwalu, north-east DR Congo.

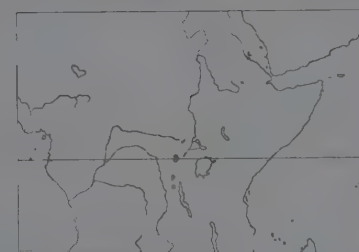
Genus has been merged with *Lioptilus*, but perhaps closer to *Phyllanthus*; differs from latter in smaller and weaker bill with relatively broader base (less laterally compressed), more slit-like nostrils (as *Turdoides*), and more slender feet. Present species forms a superspecies with *K. rufocinctus*, and sometimes considered to be conspecific. Individuals of present species seen in mountains W of L Kivu not assigned to race, but possibly belong with nominate. Three subspecies recognized.

**Subspecies and Distribution.**

*K. c. chapini* Schouteden, 1949 – E DR Congo (from W of L Albert S to W of L Edward).

*K. c. nyombensis* (Prigogine, 1960) – Mt Nyombe region of E DR Congo.

*K. c. kalindei* (Prigogine, 1964) – W of N end of L Tanganyika (E DR Congo).



**Descriptive notes.** 18–19 cm. Broadly similar to *K. rufocinctus*, but with blackish-chestnut cap, paler rufous throat, pale chestnut wing flash. Nominative race has crown dark chestnut, sometimes with blackish scaling, switching abruptly to olive upperparts except for rufous-chestnut rump; dark olive-brown upperwing with rufous-edged primaries (dull wing flash), tail blackish-brown; face (lores, superciliary area, cheek and ear-coverts) pale ochrous-olive; chin and upper submoustachial area buffy, shading on lower submoustachial area, throat and upper breast to dull rufous, which in turn shades on breast side, lower breast and remain-

ing underparts to rufous-tinged dull ochrous-olive, vent dull chestnut; iris dark; bill brownish, paler lower mandible; legs dark brown. Sexes similar. Juvenile has crown more maroon-brown. Race *nyombensis* has duller crown than nominate, grey sides of head, paler throat; *kalindei* is like previous but darker on crown, face and upperparts, with wing flash and vent brighter rufous. VOICE. Call harsh and chattering, often in chorus; similar to that of *K. rufocinctus*, but somewhat higher-pitched.

**Habitat.** Transitional broadleaf evergreen forest, at 1000–1650 m.

**Food and Feeding.** No information on diet. Found in flocks of up to ten individuals, foraging in middle and upper storeys of forest. Associates with other species, particularly bulbuls (Pycnonotidae), in bird waves.

**Breeding.** May–Jun. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Albertine Rift Mountains EBA. Evidently rather rare. Has a relatively small range, and its habitat is under threat as a consequence of clearance for shifting agriculture.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Chapin (1953), Fry *et al.* (2000), Lippens & Wille (1976), Prigogine (1960, 1964, 1971), Schouteden (1949, 1956), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Vande weghe (1988).











**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Berlioz (1930), Choudhury (2003), Godwin-Austen (1874), Grinnett *et al.* (1938), Harrington (1909, 1914a), Hume & Oates (1889), Inskip & Inskip (1991), Inskip *et al.* (2000), Kinnear (1994), Ludlow & Kinnear (1997, 1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952, 1961), Ripley *et al.* (1991), Robson (2000), Singh (1995), Smythies (1940, 1949), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stuart Baker (1933), Wang ZhiJun & Wei Tianhao (1983).

### 196. Chestnut-winged Laughingthrush

*Dryonastes berthemyi*

**Other common names:** Buffy Laughingthrush, Chinese Rusty Laughingthrush

**Distribution.** SE China: NW & C Yunnan and SC Sichuan E to C Guizhou, Hunan, SE Anhui and NW Zhejiang. S to NE Guangxi. N Guangdong and NW Fujian.

to buff and tinges mid-grey; vent white; iris grey or brown with blue outer ring; orbital skin blue; bill black, yellow tip; legs yellowish-tan. Sexes similar. Juvenile is generally duller than adult, crown paler, less obvious white fan tips. **Voice.** Song consists of loud, melodious and variable whistles, including 'hi-hi-hoo-hoo-hoo-hoo-hoo-hoo' ('hi' subdued, weak and rising, 'hoo'

**Bibliography.** Berlitz (1930), Caldwell & Caldwell (1931), Cheng Tsohsin (1976, 1987), Cheng Tsohsin *et al.* (1963), Collar (2006), David & Oustalet (1877), Deng Xuejian *et al.* (1995), Dowell *et al.* (1997), Huang Qing, Deng Heli & Mao Ke (1995), Huang Qing, Huang Yongzhao & Deng Heli (1993), King (1989a), La Touche (1925–1930), Lee Kwok Shing *et al.* (2006), Lewthwaite (1956), Li Guiyuan *et al.* (1993), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Stressemann (1923c), Traylor (1967), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Zhu Xi & Fan Houde (1995).

### 197. Rusty Laughingthrush

*Dryonastes poecilorhynchus*

**Other common names:** Scaly-headed/Rufous Laughingthrush, Taiwan Rusty Laughingthrush

**Distribution.** Taiwan.



**Bibliography.** Berlioz (1930), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Collar (2006), Hachisuka & Udagawa (1950, 1951), Isenberg (1970), Koh Chaonien & Lee Peifen (2003), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Smith & Yu Hontsen (1992), Yen Chungwei (1990).

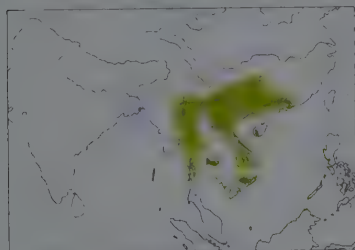
### 198. Black-throated Laughingthrush

*Dryonastes chinensis*

*D. c. propinquus* Salvadori, 1913 - S Myanmar (Tenasserim) and W Thailand.



*D. c. chinensis* (Scopoli, 1786) – SE China (SE Yunnan E to Guangxi and C Guangdong), NE, C & S Laos and Vietnam (S to C Annam).  
*D. c. monachus* (Swinhoe, 1870) – Hainan I.  
*D. c. germaini* Oustalet, 1890 – S Vietnam (S Annam, Cochinchina) and adjacent E Cambodia.



**Descriptive notes.** 23–30 cm; 64–113 g. Dark, medium-sized laughingthrush with black on face and throat. Nominant race has forehead, bristly lores and upper submoustachial area black, black extending as eyestripe around and behind eye, narrow uneven flecks of white above black on forehead; crown and upper nape slate-grey with slight bluish tinge, shading through mid-grey on mantle to olive-tinged dark brown on remaining upperparts, upperwing and tail slightly browner, latter blackish distally; ear-coverts and side of throat (lower submoustachial area) white; chin, mid-throat and central upper breast black, neck side behind ear-coverts pale

olive-grey, sometimes tinged pale pinkish (shading from mantle onto lower breast), lower breast and belly usually mostly darkish, olive-toned grey, lower flanks and vent as posterior upperparts; iris bright red to reddish-brown, sometimes brown; bill black; legs blackish-grey or brownish-grey to brownish-flesh. Sexes similar. Dark morph (“*lugens*”) has ear-coverts and throat side varying from grey to blackish; various intergrades also occur. Juvenile is more olive-toned overall than adult, crown much duller, throat at least partly darkish grey. Race *lochmius* has paler crown than nominate, grey underparts slightly less olive, flanks and vent slightly rufescent; *propinquus* is like previous, but again slightly paler grey below and slightly more rufescent on flanks and vent, but crown more grey-blue, variable (warmer tone and greater contrast between crown and mantle in S of range); *germaini* resembles last, but crown slightly darker, upperparts darker rufescent, the colour continuing behind ear-coverts and onto breast, mid-belly mixed with mid-grey; *monachus* is smaller than others, like last but upper mantle, neck and breast slightly more olive, mid-belly not shot with grey, ear-coverts, moustachial and submoustachial areas and side of throat all blackish. **Voice.** Has repetitive, loud, rich, rather mournful, fluty song incorporating harsh, coarse “wraah” notes and squeaky whistles, like that of a *Turdus* thrush. Calls include a repeated, low, husky “how”.

**Habitat.** Broadleaf evergreen and mixed deciduous forest, secondary growth, scrub (including *Lantana camara*) and grass; to 1525 m.

**Food and Feeding.** Insects; some plant material and seeds. Usually in pairs or in small parties; flocks of up to twelve or more individuals recorded on Hainan. Often associates with other laughingthrushes. Forages in trees and bushes in lower storey. Skulking; heard more often than seen. Mixed pairs (dark morph and “typical” morph) common.

**Breeding.** Mar–Aug; multi-brooded. Nest a loose cup, made of pieces of rattan, bamboo and other leaves and roots, lined with fine and coarse roots, placed in thick bush or bamboo, usually near ground but up to 2–1 m above it. Clutch 3–5 eggs (usually 4 on Hainan), very pale milky blue to bluish-white; in captivity, incubation period 13 days and nestling period 13 days.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common in S China, where recorded in 18 (33%) of 54 surveyed sites, 52 of which are nature reserves; these include Shiwandashan National Nature Reserve and Diding Nature Reserve, where uncommon. Locally common to common in Hong Kong, where population probably of captive origin; frequently traded, at least formerly. Generally fairly common to common in SE Asian range. Common in Khao Yai National Park, in Thailand. Present in Phu Dendin National Biodiversity Conservation Area, in Laos. Common in Tam Dao and Cuc Phuong National Parks and present in Ba Be National Park and Na Hang Nature Reserve, in N Vietnam; present in eleven protected areas in the Annamese lowlands, and scarce in Nam Bai Cat Tien National Park (Cochinchina). Commonly kept in captivity; one of the most popular cagebirds in Vietnam.

**Bibliography.** Berlioz (1930), Bingham (1903), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Corlett (1998), Cox *et al.* (1992), David-Beaulieu (1932, 1939, 1944, 1950), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Eames *et al.* (2001), Engelbach (1932), Goes (1999b), Haensel (1988), Hill (2000), Hopwood (1919), Hume & Davison (1878), King & Han Lianxin (1991), King & Liao Weiping (1989), La Touche (1923, 1925–1930), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Mace (1994), Meyer de Schauensee (1984), Nguyễn Đức Tu *et al.* (2001), Robbins *et al.* (2006), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn C & Truong Van La (1993a), Robson, Eames, Wolstenholfe *et al.* (1989), Round (1999), Smith *et al.* (1943), Smythies (1986), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Tordoff *et al.* (2002), Viney *et al.* (1994), Võ Quý (1971), Wickham (1929), Winkendick (1993), Yen Kwokying (1934a), Zheng Zuoxin *et al.* (1983).

## 199. Chestnut-backed Laughingthrush

### *Dryonastes nuchalis*

**French:** Garrulaxe à nuque marron

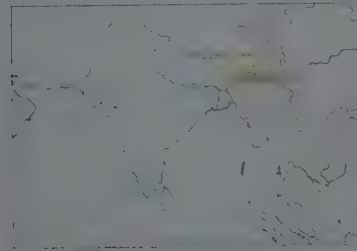
**Spanish:** Charlatán Nuquipardo

**German:** Rotnackenhäherling

**Other common names:** Ogle's Laughingthrush

**Taxonomy.** *Garrulax nuchalis* Godwin-Austen, 1876, Lhota, Naga Hills, Nagaland, India. Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. May form a superspecies with *D. chinensis*, and has been treated as conspecific. Monotypic.

**Distribution.** NE India (SE Arunachal Pradesh S to SE & E Assam and Nagaland) and N Myanmar.



**Descriptive notes.** 23–26 cm. Medium-sized laughingthrush with dark grey-blue crown, chestnut mantle and neck side, and black face and broad mesial stripe offset by whitish from ear-coverts to breast. Bristly lores, upper submoustachial and forehead are black, this colour extending around and behind eye in narrow eyestripe, a few narrow uneven flecks of white above black on forehead; crown dark slate-grey, well demarcated from rufous-chestnut nape, upper mantle and neck side bordering ear-coverts; the shading sharp, to olive-tinged rufescent brown on lower mantle and a shade darker on back to uppertail-covert; upperwing and tail, wing with pale olive-grey tinges; tail distally blackish on outer feathers.

chin, narrow area of central throat and slightly larger area of mid-breast black (some feathers on mid-breast tipped warm brown), ear-coverts to outer throat and lower breast side whitish, shading to buffy pinkish-grey on lower breast and upper belly, to greyer and more olive-brown on flanks and lower belly (same colour as lower upperparts); iris brick-red to purplish-crimson, orbital skin grey; bill black, sometimes dark horn; legs greyish-flesh to brownish. Sexes similar. Juvenile apparently undescribed. **Voice.** Song very like that of *D. chinensis*, includes variety of mellow whistles, alternating between higher and lower short slurred notes, usually a few repetitions of one note type per phrase before changing to another, slightly different type with hardly a pause, e.g. “whit-oo-whit-oo-whit, whééoo-whééoo-whééoo, tiu-whit-tiu tiu-whit-tiu tiu-whit-tiu, whit-no-whit-oo...”. May include some mimicry.

**Habitat.** Second growth, thickets, scrub-jungle, rocky scrub-clad ravines, tall grass, bamboo, overgrown abandoned cultivation, edges of broadleaf evergreen forest; lowlands to 915 m.

**Food and Feeding.** Insects, including ants (Formicidae). Found in small parties, sometimes in company with other laughingthrushes. Forages mainly on ground, and under dense vegetation; skulking.

**Breeding.** Mar–Jul. Nest reportedly a neat and compact cup, outer part made of bracken, internal part of dead leaves and broad grass blades, lined with moss, rootlets and fibres, placed within c. 1 m of ground in dense bush. Clutch 2–3 eggs, usually 3, very pale blue (very rarely white); incubation by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in (and responsible for defining) Northern Myanmar Lowlands Secondary Area. Generally uncommon in Myanmar, and in Assam judged locally not uncommon. Few recent records of this species, however, and current status poorly known, at least in part because much of its range is infrequently visited by ornithologists.

**Bibliography.** Ali & Ripley (1972), Anon. (2006d), Berlioz (1930), Butchart & Stattersfield (2004), Choudhury (2000), Collar *et al.* (2001), Grimmett *et al.* (1998), King *et al.* (2001), Rasmussen & Anderton (2005), Robson (2000), Singh (1995), Smythies (1986), Stanford (1935), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

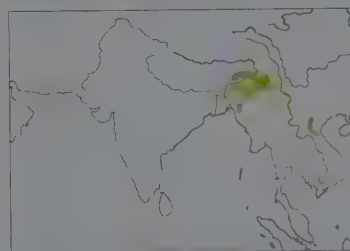
## 200. Rufous-vented Laughingthrush

### *Dryonastes gularis*

**French:** Garrulaxe à queue rousse **German:** Roststeiðhäherling **Spanish:** Charlatán Culirrufo  
**Other common names:** Yellow-breasted/Yellow-throated/McClelland's Laughingthrush

**Taxonomy.** *Ianthocincla gularis* McClelland, 1840, Cachar, or possibly Sadiya, Assam, India. Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. May form a superspecies with *D. delesserti*, and in the past commonly considered conspecific. Birds from Laos described as a geographical race, *auratus*, but considered inseparable from those elsewhere in species' range. Monotypic.

**Distribution.** SE Bhutan, NE Indian hill states and N Myanmar; also N & C Laos and adjacent N Annam (Vu Quang), in Vietnam.



**Descriptive notes.** 23–25.5 cm. Medium-sized longish-billed skulking laughingthrush, grey on crown and flanks, rusty brown on upperparts and thighs, with black mask and primrose-yellow throat to belly. Crown is dull olive-tinged mid-grey (forehead with yellow tinge), this extending down side of neck onto upper and middle flanks, where colour paler, and shading abruptly into dull chestnut on upperparts and upperwing; tail slaty centrally with bright rufous outer feathers; face mask formed by black of lores extending backwards as short supra-ocular supercilium and cheek patch onto upper ear-coverts; black interramal spot, rest of chin,

throat, submoustachial area and lower ear-coverts to mid-breast and mid-belly primrose-yellow (becoming off-white in museum specimens), lower flanks and vent rufous-tan; iris reddish-brown to bright red, orbital skin and rounded triangular skin patch behind eye ochre-yellow or dark slate (significance of difference unknown); bill dull slaty black to dull blackish-brown, paler base; legs yellow-ochre to bright reddish-yellow. Sexes similar. Juvenile is initially much brighter rufescent overall than adult, with rufous-fringed brown crown, and bright rusty sides and breast. **Voice.** Flocks utter harsh rattling chirrs interspersed with rather nasal, discordant, high-pitched whistled phrases. Possible songs include clear, very sweet, chiming, slightly upslurred and then strongly downslurred whistles, “fwééuuuu”, and more prolonged, elastic-sounding “fwééuuuuéééé” (strongly upslurred near end). Also, indistinct mellow squabbling and chattering notes from flocks.

**Habitat.** Broadleaf evergreen forest, secondary growth, scrub, sometimes bamboo; 90–1220 m in NE India, but reaching 1300 m in Bhutan; 300–1220 m in SE Asia.

**Food and Feeding.** Mostly insects, also berries and seeds. Found in quite vocal flocks of 6–15 and sometimes up to 40–50 individuals: sometimes associates with other laughingthrushes. Forages mostly on ground, occasionally ascends small understorey trees. Scratches among leaf litter. Skulking and very shy.

**Breeding.** Apr–Jul. Nest reportedly a bulky, shallow, rather untidy cup, made of tendrils, twigs, creepers and roots, lined with black fern and moss roots, placed 1–6 m above ground in bush or sapling. Clutch 2–3 eggs, white to very pale blue or pale blue-green. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare in E Bhutan (at W edge of species' range). Status in India poorly understood, but locally not uncommon in Assam and fairly common in Nandapha National Park, in Arunachal Pradesh. Generally local in SE Asian range. Present in Vu Quang Nature Reserve, in Vietnam. Claimed record from SE Bangladesh now withdrawn.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Berlioz (1930), Choudhury (2000), Collar (2006), David-Beaulieu (1944), Davidson (1998), Delacour & Jabouille (1931a), Eames *et al.* (2001), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), King *et al.* (2001), Koeiz (1954), Ludlow & Kinnear (1937, 1944), Mayr (1938), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Singh (1995), Smythies (1986), Spierenburg (2005), Stanford (1935), Stanford & Ticehurst (1935, 1938), Stuart Baker (1893, 1901, 1922), Thompson *et al.* (1993).

## 201. Wynaad Laughingthrush

### *Dryonastes delesserti*

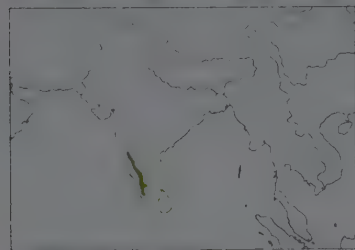
**French:** Garrulaxe de Delessert **German:** Rostflankenhäherling **Spanish:** Charlatán de Delessert



**Taxonomy.** *Clateropus*. *Delesserti* Jerdon, 1839, Kotagiri, Nilgiri Hills, India.

Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. May form a superspecies with *D. gularis*, and in the past commonly considered conspecific. Monotypic.

**Distribution.** SW India from Goa and Belgaum S to Kerala and W Tamil Nadu.



**Descriptive notes.** 23–26 cm; 78 g. Crown and rear superciliary area to mantle are dark slaty grey, scapulars, back, upperwing-coverts and tertials dull chestnut-brown, shading to rich rufous on uppertail-coverts; tail brownish-black, primaries with dull pale olive-grey fringes; face (lores, supercilium to above eye, cheek and ear-coverts) slightly glossy blackish; chin, submoustachial area and throat white, shading to pale grey on breast, to dull orange-rufous on mid-belly and to rich rufous on lower flanks, thighs and vent; iris red to maroon-brown; upper mandible dark brown or blackish-brown, lower mandible whitish-flesh to

yellowish-flesh; legs pinkish-flesh. Differs from very similar *D. gularis* in having pale lower mandible, darker grey crown and nape, darker brown upperparts and wings, darker and uniform tail (darker than back), paler and less contrasting mask, sparsely feathered straw-coloured or buff-coloured interarmal region and patch at base of lower mandible, white (not yellow) chin to upper belly, and more chestnut lower flanks and belly. Sexes similar. Juvenile is duller on crown than adult, more chestnut above, warmer on breast, iris pinkish-buff, orbital skin paler yellow, legs dusky. Voice. Songs include loud, strident, musical, falling, “tsééurp (repeated irregularly in chorus with other notes), coarser, more clanging “juur-juur-jhéér-jhéér-jhéér-jhéér-jhéér” (note number variable), and slower, more piping “jhéér-jhéér-jhéér”. Song described also as penetrating nasal whistled phrase of 2–4 descending notes, “tree-tree-true”, and flocks heard to give particularly frenzied, discordant series of screeches, squeals and cracked rattles. Calls include metallic, rasping churr and other less distinct low conversational notes.

**Habitat.** Broadleaf evergreen and semi-evergreen forest (including *Strobilanthes*), thorny canebrakes and black cardamom (*Amomum subulatum*) sholas; at 155–1220 m, mostly 455–760 m.

**Food and Feeding.** Mostly insects, also berries and seeds. Found in flocks of 6–15 and sometimes up to 40–50 individuals. Forages mostly on ground; occasionally ascends into small understorey trees. Quite skulking.

**Breeding.** Dec–Sept. Probably co-operative breeder. Nest described as smallish cup and as rather bulky, almost semi-domed cup, made of grass, leaves, weed stems, twigs, creepers and roots, lined with roots, placed within 2 m of ground in bush, tangle of creepers and briars (*Rosa*) or understorey vegetation (including *Strobilanthes*). Clutch 2–4 eggs, usually 2–3, white. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Western Ghats EBA. Uncommon to common throughout range; present in Mudumalai National Park, in Tamil Nadu. In surveys in 1973–1997 found in 15 areas, including five protected areas, namely Sultan’s Battery, Silent Valley, Periyar East, Periyar West and Tenmalai.

**Bibliography.** Ali & Ripley (1972), Berlioz (1930), Collar (2006), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Rasmussen & Anderton (2005), Stattersfield *et al.* (1998), Stuart Baker (1922), Zacharias (1997), Zacharias & Gaston (1993, 1999).

## 202. Blue-crowned Laughingthrush

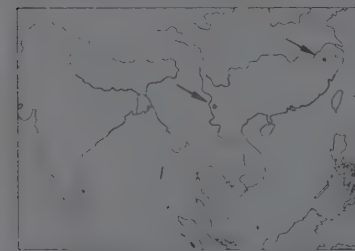
### *Dryonastes courtoisi*

**French:** Garrulaxe de Courtois **German:** Blaukappenhäherling **Spanish:** Charlatán Coroniazul  
**Other common names:** Courtois’s Laughingthrush

**Taxonomy.** *Garrulax Courtoisi* Ménégau, 1923, Wuyuan, north-eastern Jiangxi, China.

Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. Very closely related to, and until recently treated as conspecific with, *D. galbanus*. Isolated population in Simao, in S Yunnan, described as a geographical race, *simaoensis*, on basis solely of yellowish-grey breastband, but this sometimes present in Jiangxi population. Treated as monotypic.

**Distribution.** S & E China: Yunnan (Simao region), and NE Jiangxi (Wuyuan area).



**Descriptive notes.** 24–25 cm. Crown and nape are dull grey-tinged blue, with line of pale cobalt-blue above black bristly forehead; mantle, scapulars, back and tertials ochrous-fawn, outer greater wing-coverts and outer webs of primaries pale bluish-grey; tail ochrous-fawn with bluish-grey basal half, and with broad blackish-brown tips centrally, and broad blackish-brown subterminal marks and whitish tips on outer feathers; face (lores, low forehead, superciliary area to just behind eye, ear-coverts), upper submoustachial area and chin glossy black, cutting sharply to maize-yellow on throat (but border with black chin white), this in turn shading to greyish-olive on breast, breast side and flanks, with mid-belly whitish-yellow, thighs greyish-white, undertail-coverts white; iris reddish; bill black; legs greyish. Differs from very similar *D. galbanus* in having bluer crown and nape, longer and broader black supercilium (creating larger black patch on ear-coverts), darker brown upperparts, blue-grey fringes of primaries, more grey-blue basal half of tail and broader white tail tips, somewhat longer wing. Sexes similar. Juvenile is like adult, but with bare yellow eyering (in captivity, lost after six months). Voice. Flocks call with continuous nervous titling, and much clearer but subdued, quite nasal but pleasant irregular series of “puiui”, “diui”, “dion” or “diew” notes, sometimes louder “diui-tsiu-pi-ju...”.

**Habitat.** Mixed evergreen and deciduous forest and forest patches, and adjacent bushy areas, also clumps of large trees near human settlements. Nestlings fed mainly with insects. Forages in flocks of up to 40 or more individuals. Forages on ground and in bushes and trees. On ground turns leaf litter; on tree trunks picks out invertebrates; feeds among leafy branches, clinging to overhanging foliage of climbing plants, gleaning for insects.

**Feeding.** Apr–Jul, often two broods reared. Colonial, with several nests simultaneously active in small area, cooperative breeder, up to four individuals attending chicks at one nest, at least three seen to feed chicks. Nest an open cup made of twigs and grasses, lined with dry grasses, placed 4–15 m up in tall tree e.g. Chinese sweet gum (*Liquidambar formosa*) and camphor (*Cinnamomum*

*camphora*). In captivity clutch 3–5 eggs, creamy white, incubation period 14 days, nestling period 13–16 days. Red-billed Blue Magpie (*Urocissa erythrorhyncha*) presumably a nest predator, seen chased away from nest vicinity by breeding group.

**Movements.** Disappears from breeding area at Wuyuan in non-breeding period Aug–Mar; whereabouts at that time unknown, but presumed to make short-distance movements into surrounding areas.

**Status and Conservation.** CRITICALLY ENDANGERED. Two geographically widely separated populations. Known from a single area around Wuyuan, in lowland areas mostly close to R Le’an, where stands of tall trees required for nesting remain, with all known sites close to human habitation and one even in a small town; total number of birds in these localities estimated at 150–190. “Small Protected Areas” have been established at various sites around Wuyuan; interference and predation by squirrels (*Sciuridae*) inferred at some colonies, and control measures needed at these in order to prevent breeding failure. Second population, at Simao, in Yunnan, known from three birds collected in 1956, but all trees now cleared from original locality and villager reported that, although common in 1970s, species had not been seen in 1990s. A curious aspect is appearance of this species in European and American bird trade in 1988–1989; individuals were acquired by and distributed to several conservation-oriented zoos and bird gardens in UK, Netherlands, Germany, France and Italy, where they are being bred under consortium arrangements, with total at end of 2006 of 70 individuals (38 males, 27 females and five unknown) in 17 collections, and zoos in USA also hold small populations (total of 36 individuals in ten collections in 2006); also, nine in Hong Kong bird collections. Origin of these traded birds unknown, evidence indicating both Yunnan and Jiangxi, but possibly an undiscovered population was involved.

**Bibliography.** Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), Collar (2006), He Fenqi (2004), He Fenqi & Lin Jiansheng (2006), Hong Yuanhua *et al.* (2003), La Touche (1925–1930), Lindholm (1997), Long *et al.* (1994), Meyer de Schauensee (1984), Oldenettel (1989b, 1998), Pasini *et al.* (1994), Reul-Schneider & Schneider (2006), Schneider & Reul-Schneider (2003), Schneider *et al.* (2002), Wilkinson *et al.* (2004), Zheng Zuoxin & Tang Ruichang (1982).

## 203. Yellow-throated Laughingthrush

### *Dryonastes galbanus*

**French:** Garrulaxe à gorge jaune **German:** Gelbbauchhäherling **Spanish:** Charlatán Goligualdo  
**Other common names:** Austen’s/Yellow-bellied Laughingthrush

**Taxonomy.** *Garrulax galbanus* Godwin-Austen, 1874, Manipur, India.

Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. Very closely related to, and until recently treated as conspecific with, *D. courtoisi*. Monotypic.

**Distribution.** NE India (S Assam, Nagaland, Manipur, Mizoram), SE Bangladesh and adjacent W Myanmar.



**Descriptive notes.** 23–24.5 cm; 55–57 g. Superficially similar to *D. gularis*, but smaller and slimmer, with shorter bill, black chin, ochrous rear upperparts, no rufous on underparts, bold white tail tips. Crown and nape are pale greyish, shading on nape through paler grey to ochrous-fawn or olive-tinged pale warm brown on upperparts, wing fringes and tail, latter with broad blackish-brown tips centrally and broad blackish-brown subterminal marks and whitish tips on outer feathers; neat face mask formed by black bristly forehead, lores, short supercilium, ear-coverts, upper submoustachial area and chin; rest of central underside maize-

yellow (fading to whitish in museum specimens), most intense on throat, but breast shaded with greyish-olive, breast side and flanks greyish-olive, thighs pale yellow to yellowish-white (sometimes tinged as flanks), undertail-coverts white; iris brownish-yellow to orange-red, orbital skin below and behind eye blue or pale blue; bill blackish, tip sometimes whitish-horn; legs blackish-grey to pale silvery leaden. Sexes similar. Juvenile has crown blackish. Voice. Poorly documented. Feeble chirping calls from flocks.

**Habitat.** Tall grass mixed with trees and shrubs, outskirts of and more open areas within dense broadleaf evergreen forest, dense scrub, brushwood, open forest, cut-over secondary forest interspersed with tall grass; at 610–1300 m.

**Food and Feeding.** Mostly insects, also small seeds. Found in pairs or in small parties of up to six individuals, sometimes more (as many as 50–80 recorded), often in association with *D. ruficollis*. Forages mainly on ground.

**Breeding.** Apr–Jun in India and Myanmar. Nest a large, roughly made, flattish to deep cup, of grasses, bamboo leaves, creepers, tendrils, fine twigs and moss roots, lined with yellow grass stems, rootlets, fern roots and stems, placed 0.6–3 m above ground in bush, shrub, tangle of wild raspberry (*Rubus*) or creepers. Clutch 2–4 eggs (usually 3 in India; 5 in captivity), pure white or occasionally very pale blue or creamy white; incubation period 13–15 days. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. In India, formerly locally not uncommon in Assam; not uncommon in Nagaland in 1990s, when regularly found on sale as food in markets. Scarce and local in Myanmar.

**Bibliography.** Ali & Ripley (1972), Berlioz (1930), Choudhury (2000, 2001), Collar (2006), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Koelz (1954), Long *et al.* (1994), Pasini *et al.* (1994), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Smythies (1986), Stuart Baker (1893), Thompson *et al.* (1993).

## 204. White-cheeked Laughingthrush

### *Dryonastes vassali*

**French:** Garrulaxe de Vassal **German:** Schwarzohrhäherling **Spanish:** Charlatán Cariblanco

**Taxonomy.** *Dryonastes vassali* Ogilvie-Grant, 1906, Nhatrang Province, southern Annam, Vietnam. Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. Monotypic.

**Distribution.** S Laos, S Vietnam (C & S Annam) and adjacent extreme E Cambodia.

**Descriptive notes.** 26.5–28.5 cm. Medium-sized laughingthrush, pale brown above with dark grey head, buffy below with black mask and bib and white lower ear-coverts. Crown is slaty grey, shading paler on nape and mantle, rest of upperparts slightly ochrous-tinged rufescent brown, lower rump paler and greyer, upperwing medium grey-brown with pale ochre-grey fringing; basal half of tail olive-tinged greyish, distal half blackish-brown, tail tips whitish (buffier on central pair); bristly



flocks can be very noisy, uttering harsh extended rattles and short quick "whi" notes.

**Breeding.** Mar-Jun in Vietnam. Nest ■ cup. No information.

**Movements.** Resident.

**Bibliography.** Bertloz (1936), Brunel (1978), David-Beaulieu (1939, 1950), Davidson *et al.* (1997), Delacour & Jabouille (1931a), Delacour *et al.* (1928), Dickinson (1970), Duckworth & Hedges (1998), Duckworth *et al.* (1998), Eames (1995), Eames & Ericson (1996), Eames, Eve & Tordoff (2001), Eames, Lê Trong Trại & Nguyễn Cu (1995), Engelbach (1932), Hill *et al.* (2001), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Stattersfield *et al.* (1998), Thewlis, Duckworth *et al.* (1996), Thewlis, Timmins *et al.* (1998).

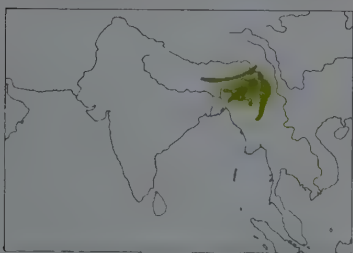
*Dryonastes ruficollis*

**French:** Garrulaxe à col roux      **German:** Rothalshäherling      **Spanish:** Charlatán Cuellirrufo

**Taxonomy.** *Ianthocincla ruficollis* Jardine and Selby, 1838, Himalayas.

Genus traditionally subsumed in *Garrulax*, but differs in some small details of morphology. Monotypic.

**Distribution.** SC Nepal, Bhutan, all NE Indian states, NE Bangladesh, W, N & NE Myanmar, and adjacent parts of China (ZE Xizang, W Yunnan).



**Descriptive notes.** 22–27 cm; 51–75 g. Medium-sized laughingthrush, cold olive-brown above and below, with black face to breast, rufous neck patch and vent, and black tail. Has mid-crown to nape slaty grey, upperparts, upperwing, belly and flanks dull greyish olive-brown, wing with slightly paler fringes, tail blackish; entire face, including bristly forehead and lores, supercilium, ear-coverts and sub-moustachial area, and chin to breast black; area on neck behind ear-coverts and bordering upper breast light rufous-chestnut, mid-belly, thighs and vent also light rufous-chestnut; iris

ring yellowish; bill brownish-black; legs dark brown to black. Sexes similar. Juvenile is somewhat paler and browner overall than adult. Voice. Song consists of fairly quickly repeated, jolly whistled phrases, "wiwi'wi-whu, whi-yi-ha" etc. (hurried at beginning). Also more prolonged, slurred, scratchy outpourings. Rather high, clear and slightly shrill "krkrkrkkéérkkóókkéérkóó" (starts with a few quick notes, then builds in steeply inflected notes to much higher, louder crescendo, falling again steeply at very end), varied with extra notes either on end or separately. Calls with repeated, rather high, shrill "ch'ya'a" or "cher" and harsh "wh'it" notes and slow short rattles. Sharp, clear, strongly descending, cheeping, "slééér" notes, varied with less sharp notes and a few short guttural trills.

**Habitat.** Broadleaf forest, forest edge, secondary growth, scrub and grass, bamboo-jungle, tall grass and reeds, often along streams, patches of Siam weed (*Chromolaena odorata*), brambles (*Rubus*), cultivation borders, hedgerows, tea gardens. Occurs at 120–1645 m through most of range; 300–2000 m (recorded up to 2200 m) in Bhutan, where highly secretive in summer months and habitat selection then unknown.

**Food and Feeding.** Insects, including ants (Formicidae), also small molluscs; also berries and seeds, including cultivated millet (*Pennisetum glaucum*) and Asian cultivated rice (*Oryza sativa*). Outside breeding season occurs in flocks of up to 30 or more individuals; parties break up in Mar in Bhutan. Forages on ground or among low bushes.

**Breeding.** Mar–Aug. Nest described as a rather compact, deep cup, somewhat untidy externally, made of dry bamboo or other leaves, grasses, roots, weed stems, creeper stems and tendrils, occasionally dry moss and lichen, lined with black or brown rootlets, placed in bush or brambles, usually 1–1.8 m (occasionally up to 6 m) above ground. Clutch 3–4 eggs, almost white with delicate bluish-green tinge or pale milky blue. No other information.

**Movements, Resident.**

**Status and Conservation.** Not globally threatened. Very local in Nepal, where recorded mainly, locally frequently, in Royal Chitwan National Park. Frequent in Bhutan, where present in Thrumshingla National Park. Locally common in India, where uncommon in Kaziranga National Park and rare in Nameri National Park (Assam), and present elsewhere in NE India in (at least) Buxa Tiger Reserve (West Bengal) and Eaglenest Wildlife Sanctuary and Namdapha and Mouling.

National Parks (all Arunachal Pradesh). Uncommon in Myanmar. In China, uncommon in lowlands of SE Xizang and rare in extreme W Yunnan.

Bibliography. Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Bertozzi (1930), Betts (1956), Birand & Pawar (2004), Choudhury (2003), Godwin-Austen (1870), Grimm *et al.* (1998), Hopwood & Mackenzie (1917), Hume & Oates (1889), Inskip & Inskip (1991, 1993b), Inskip *et al.* (2000), Katti *et al.* (1992), King *et al.* (2001), Li Dehao *et al.* (1978), Ludlow & Kinnear (1944), Mayr (1938), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Singh (1995), Smythies (1986), Spiersburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stuart Baker (1893), Zheng Zuoxin *et al.* (1983).

*Garrulax castanotis*

**French:** Garrulaxe de Hainan    **German:** Rotwangenhäherling    **Spanish:** Charlatán Carirrufo

**Taxonomy.** *Dryonastes castanotis* Ogilvie-Grant, 1899, Five-finger Mountains, Hainan, China. Formerly treated as conspecific with *G. maesi*. Two subspecies recognized.

### Subspecies and Distribution.

*G. c. varennei* (Delacour, 1926) – E Tonkin (Mt Ba Vi) and N & C Annam, in Vietnam, and adjacent E Laos.

*G. c. castanotis* (Ogilvie-Grant, 1899) – Hainan I (China).

**Descriptive notes.** 28–30.5 cm; 80–115 g. Fairly large, slaty-grey laughingthrush with rufous-chestnut ear-coverts and blackish face. Nominative race has bristly lores and forehead black, this colour extending above eye in short supercilium; forehead dirty dark olive-grey, shading to darkish grey on crown and remaining body plumage; upperwing and tail darker, slaty grey; chin, submoustachial area, throat and breast blackish-brown, elongate ear-coverts rufous-chestnut and forming large circular head-side patch; iris brown to red-brown; bill black; legs greyish. Sexes similar. Juvenile apparently undescribed. Race *varennei* is somewhat larger.

than nominate, with rear supercilium and patch behind ear-coverts white, ear-coverts paler and shorter (hence smaller patch), crown to mantle and lower underparts paler, latter contrasting more with throat and upper breast. VOICE. Loud outbursts of extended cackling, typically combining rapid chattering and repetitive double-note phrases: very like that of *G. mossi* and *G. milloti*.

**Habitat.** Submontane broadleaf evergreen forest, at 400–1700 m.

**Food and Feeding.** Mostly insects. Found in parties of up to ten or more individuals, sometimes associating with other species in bird waves. Forages mainly among leaf litter on ground, but climbs up to investigate danger; flocks move through lower to middle storeys before descending to ground to feed. Foraging habits identical to those of *G. maesi*.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Locally common across range. In Laos, present in Nam Kading National Biodiversity Conservation Area (NBCA), where common in the higher Nam An valley, Nakai-Nam Theun NBCA, where commonest laughingthrush at head of Nam Phao valley and in dry evergreen forest above 1000 m, and in Nakai-Nam Theun Extension, where commonest laughingthrush in two study areas (Nam Kwai and the Ban Nahoua logging road). Present in five protected areas in the Annamese lowlands, in Vietnam.

**Bibliography.** Berlioz (1930), Collar (2006), David-Beaulieu (1944), Davidson (1998), Delacour & Jabouille (1931a), Eames *et al.* (2001), King & Liao Weiping (1989), Meyer de Schauensee (1984), Robson (2000), Round (1999), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Timmins & Trinh Viet Cuong (1999).

*Garrulax maesi*

**French:** Garrulaxe de Maës      **German:** Maeshäherling      **Spanish:** Charlatán de Maës

**Other common names:** Maes's Laughingthrush

**Taxonomy.** *Dryonastes Maesi* Oustalet, 1890, Tam Dao Mountains, Tonkin, Vietnam.

**Distribution.** SE China (SC Sichuan, extreme NE & SE; Yunnan, N & SE Guizhou, Guangxi, N Guangdong) and N Vietnam (NW & E Tonkin).

**Descriptive notes.** 28–30.5 cm; 107–118 g. Plain dull grey laughingthrush with black face, white behind ear-coverts and dull brownish breast. Forehead and narrow superciliary crown-line are pale grey to whitish-grey, becoming white on rear crown-line, which joins with white of nape side and neck side behind pale grey ear-coverts; rest of crown and upperparts mid-grey with slight brown tinge, rump and uppertail-coverts slightly browner, upperwing and tail darker and browner; bristly lores, short supercilium, cheek and area below (to just behind) eye and chin black, skin forming continuous mass encircling eye and just over top of bill base.

lower throat and upper breast buffy greyish-brown with paler fringes (faint scale appearance), lower breast to vent slightly paler grey than upperparts, lower flanks and undertail-coverts as rump; iris brown to red-brown; bill black; legs greyish. Sexes similar. Juvenile has upperparts mixed with brown, throat and breast grey-brown. Voice. Sudden outbursts of extended, very loud cackling laughter.



typically a few combined of rapid chattering and repeated double-note phrases, often preceded by a few subdued "ow" notes; very similar to that of *G. castanotis* and *G. milleti*.

**Habitat.** Broadleaf evergreen forest, at 380–1700 m.

**Food and Feeding.** No information on diet. Always in flocks of up to ten or more individuals, sometimes in association with bird waves, which may include other laughingthrushes, such as *Dynamis* *hinensis*. Relatively shy and unobtrusive (apart from loud vocalizations). Feeds mainly among leaf litter on ground, but climbs up to investigate danger; flocks move through lower to middle storeys before descending to ground to feed.

**Breeding.** Apr–May in China. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Moderately common in S China, where recorded in 12 (22%) of 54 sites surveyed, 52 of which are nature reserves; these include Shiwandashan National Nature Reserve, where common, and Diding Nature Reserve, where uncommon. Locally common in N Vietnam, where present in Na Mang Nature Reserve and common in Tam Dao National Park.

**Bibliography.** Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Collar (2006), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Evans & Timmins (1998), Hill (2000), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Lê Manh Hùng *et al.* (2002), Lewthwaite (1996), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Robbins *et al.* (2006), Robson (2000), Robson *et al.* (1989), Showler, Davidson, Khounmee Salivong & Khanikhoun Khounbolin (1998), Thewlis *et al.* (1998), Tordoff *et al.* (2002), Wu Zhikang *et al.* (1986), Yen Kwokying (1934a), Zheng Baolai (1988).

## 208. Black-hooded Laughingthrush

### *Garrulax milleti*

**French:** Garrulaxe de Millet **German:** Kapuzenhäherling **Spanish:** Charlatán de Millet  
**Other common names:** Vietnam Laughingthrush

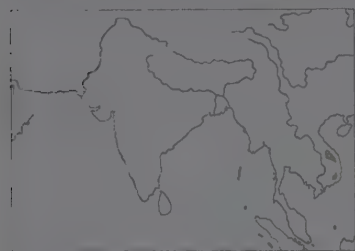
**Taxonomy.** *Garrulax milleti* Robinson and Kloss, 1919, Dalat, Annam, Vietnam.

Two subspecies recognized.

**Subspecies and Distribution.**

*G. m. sweeti* (J. C. Eames, 2002) – SE Laos and C Vietnam (C Annam).

*G. m. milleti* (Robinson & Kloss, 1919) – S Annam, in S Vietnam.



**Descriptive notes.** 28–30 cm. Large black, grey and white laughingthrush. Nominant race has head to nape, ear-coverts and breast glossy blackish, feathers of forehead and above eye pointed, area behind ear-coverts white, shading into pale grey border around clear-cut black of hood, on mantle turning to dark olive-brown of upperparts; upperwings slatier and tail even darker; on belly grey shades darker, into dull olive-brown on flanks, thighs and vent; iris brown to crimson, triangular postorbital patch pale blue; bill black; legs blackish or dull plumbeous. Sexes similar. Juvenile apparently undescribed. Race *sweeti* has greyer, less

brown-tinged, body and darker wings and tail than nominate. Voice. Very loud outbursts of extended rapid cackling laughter, incorporating prolonged, rapid rattling calls, also ticking notes; very like that of *G. strepitans*.

**Habitat.** Broadleaf evergreen forest, at 800–1650 m.

**Food and Feeding.** No information on diet. Found in flocks of 3–10 individuals, sometimes in association with other species, particularly other laughingthrushes, in bird waves. Forages mostly on ground in dense undergrowth, but also ascends trees to middle storey and lower canopy.

**Breeding.** Season May–Jun. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Da Lat Plateau EBA and Kontum Plateau Secondary Area (latter now becomes a full EBA with discovery of *Trochalopteron ngoclinhense* and *Actinodura sodangorum*). Confined to the Da Lat and Di Linh Plateaux in Vietnam, where locally common, and the Central Highlands of Vietnam, where fairly common around Ngoc Linh, and in Xe Kong and Attapu provinces, in Laos. As this species occurs at relatively low altitudes, it is vulnerable to habitat destruction through agricultural encroachment, charcoal-burning and fuelwood collection, particularly as the human population of the area is increasing because of government resettlement programmes. It occurs in a few protected areas, including Dong Ampham National Biodiversity Conservation Area, in Laos, and Ngoc Linh, Kon Ka Kinh, Kon Cha Rang, Thuong Da Nhim and Chu Yang Sin Nature Reserves, in Vietnam; at last-mentioned site, estimated density 0.7 birds/ha, yielding total population for the reserve of 7690.

**Bibliography.** Anon. (2006d), Berlioz (1930), Brunel (1978), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Davidson *et al.* (1997), Delacour & Jabouille (1931a), Eames (1995, 2001, 2002), Eames *et al.* (1992), Hill *et al.* (2001), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993b), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thewlis *et al.* (1998), Tordoff *et al.* (2000).

## 209. Cambodian Laughingthrush

### *Garrulax ferrarius*

**French:** Garrulaxe du Cambodge **Spanish:** Charlatán de Camboya  
**German:** Kardamomhäherling

**Taxonomy.** *Garrulax ferrarius* Riley, 1930, Khao Kuap [12°25' N 102°50' E], Cambodia. Formerly treated as conspecific with *G. strepitans*, but more closely related to *G. milleti*. Monotypic.

**Distribution.** SW Cambodia.



grey and flanks to vent dull olive-brown; iris dark reddish-brown, orbital skin pale blue; bill black; legs dark grey-horn. Differs from similar *G. milleti* in having hood and breast chocolate-brown (not black), white neck-side patch but no continuous white collar from nape to lower breast, darker upper mantle and lower breast darker, olive-tinged wings and flanks, marginally shorter tail. Sexes similar. Juvenile undescribed. Voice. Utters rapid cackling laughter, very similar to that delivered by *G. milleti*.

**Habitat.** Inhabits broadleaf evergreen forest, occurring from 800 m up to at least 1250 m in Cardamom Mts.

**Food and Feeding.** No information available on diet. Found in flocks of up to ten individuals, sometimes in association with other species in bird waves. Forages mostly on ground in dense undergrowth.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Status under review. Scarce to uncommon in very limited range.

**Bibliography.** Collar (2006), Eames *et al.* (2002), Riley (1940), Robson (2000), Round & Robson (2001), Thomas & Poole (2003).

## 210. White-necked Laughingthrush

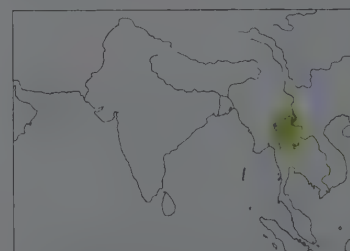
### *Garrulax strepitans*

**French:** Garrulaxe bruyant **German:** Weißhalshäherling **Spanish:** Charlatán Cuelliblanco  
**Other common names:** Tickell's/Brown-breasted Laughingthrush

**Taxonomy.** *Garrulax strepitans* Blyth, 1855, "the mountainous interior of the Tenasserim provinces", Myanmar.

Often treated as conspecific with *G. ferrarius*, but that species is now known to be closer to *G. milleti*. Monotypic.

**Distribution.** E Myanmar (including N Tenasserim), N & NW Thailand, adjacent N Laos and S China (S Yunnan).



**Descriptive notes.** 28.5–31.5 cm; 121–142 g. Large dark laughingthrush with rich olive-brown crown, dull dark rufous ear-coverts, blackish-brown face and breast and greyish-white neck sides. Forehead, crown and nape are deep warm olive-brown (forehead sometimes darker), upper mantle greyish, shading to drab olive on back, rump and wing-coverts; upperwing drab olive-slate, tail blackish-grey; bristly lores, preocular supercilium, basal ear-coverts, area under eye to chin and upper throat blackish, shading to blackish-brown on lower throat and breast; white neck side behind ear-coverts merging into pale grey lower half-collar, this sharply offsetting breast-line but merging into dark ochrous-grey underparts, sootier on flanks and vent; iris brown to reddish-chestnut, orbital skin (fairly large patch behind eye) dark slate to black; bill black; legs blackish-maroon. Sexes similar. Juvenile apparently undescribed.

VOICE. Flocks emit sudden, very loud outbursts of cackling laughter, typically combining rapid chattering and repetitive double-note phrases, like that of *G. leucolophus* but faster, incorporating more prolonged, rapid rattling calls; outbursts preceded and interspersed with clicking "tick" or "tek" notes, which serve also as contact calls.

**Habitat.** Broadleaf evergreen forest, at 500–1800 m.

**Food and Feeding.** Few data on diet; presumably largely invertebrates, but pair seen to feed on nectar 9–12 m above ground at top of silk-cotton (*Bombax*) or coral tree (*Erythrina*). Found in large parties, in undergrowth, on ground or in middle storey. Forages mainly in leaf litter, where flocks often join large bird waves. Noisy but shy.

**Breeding.** No information.

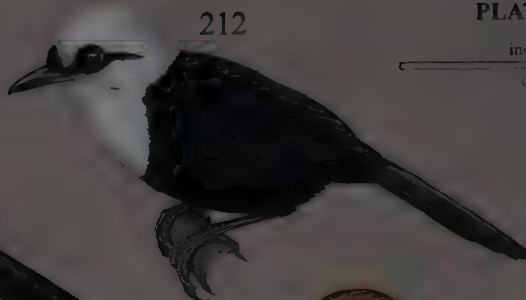
**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally fairly common in SE Asian range. Present in Doi Chiang Dao and Huai Kha Khaeng Wildlife Sanctuaries and Kaeng Krachan National Park, in Thailand. Apparently rare in China, where on edge of its range in Xishuangbanna prefecture (S Yunnan).

**Bibliography.** Berlioz (1930), Collar (2006), Deignan (1963), Delacour & Jabouille (1931a), Gyldestolpe (1916), Hume & Davison (1878), Lekagul & Round (1991), Lowe (1933), Mace (1991), Meyer de Schauensee (1946, 1984), Peng Yanzhang *et al.* (1979), Riley (1930, 1938), Robson (2000), Smythies (1986), Tizard *et al.* (1997).







ssp pectoralis



ssp munileger



## 211. White-crested Laughingthrush

### *Garrulax leucolophus*

French: Garrulaxe à huppe blanche

Spanish: Charlatán Crestiblanco

German: Weißhaubenhäherling

**Taxonomy.** *Corvus leucolophus* Hardwicke, 1815, mountains above Hardwar, Saharanpur, Uttar Pradesh, India.

Often treated as conspecific with *G. bicolor*. Races form two groups, differing in plumage pattern: W nominate and *patkaicus*, with olive-brown posterior upperparts and clear-cut breast-line, and *E. belangeri* and *diardi*, with chestnut upperparts and more extensive, less well-demarcated white underparts. Four subspecies recognized.

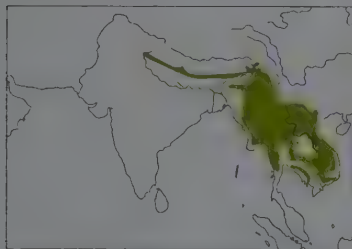
#### Subspecies and Distribution.

*G. l. leucolophus* (Hardwicke, 1815) – S Himachal Pradesh and Nepal E to NE India (Arunachal Pradesh except SE) and adjacent S China (SE Xizang).

*G. l. patkaicus* Reichenow, 1913 – SE Arunachal Pradesh and NE Indian hill states (S of S Brahmaputra), E Bangladesh, Myanmar (except SC, E & SE) and S China (W & SW Yunnan).

*G. l. belangeri* Lesson, 1831 – SC & S Myanmar (including Tenasserim) and W Thailand.

*G. l. diardi* (Lesson, 1831) – SE Myanmar, NW, NE & SE Thailand, Indochina and S China (S & SE Yunnan).



**Descriptive notes.** 26–31 cm; 108–131 g. Large chestnut-and-brown laughingthrush with white hood, crest and breast and broad black mask; long erectile crown feathers frequently raised to form crest. Nominative race has crown white, nape mid-grey (forming grey band when crest lowered), lores, cheek and ear-coverts black (forming broad elongate mask); mantle and back dull rufous-chestnut, shading into olive-brown posteriorly and on upperwing, slatier tail; throat and upper breast white, tinged pale grey at breast side, chestnut of mantle extending across lower breast and merging on upper belly into rufescent olive-brown rest of

underparts; iris brown to dark crimson, orbital skin pale bluish-slate; bill slate-black or horn-black; legs dark slate-lead to blackish-green. Sexes similar, but male may be brighter rufous above. Juvenile has shorter crest and more ashy-brown nape; may be more rufescent above, particularly on wing fringes. Race *patkaicus* is like nominate, but generally has more extensive and slightly darker chestnut on mantle; *belangeri* has entire upperparts below nape rufous-chestnut, black of lores extends narrowly across lower forehead, white of throat and upper breast extends onto belly and merges with rufous-chestnut of flanks and lower belly (rather than being sharply delineated below upper breast), remaining underparts chestnut; *diardi* is like last, but slightly stronger rufous-chestnut above, with pale grey hindcollar, still more extensive white below, to lower belly, with dull rufous-brown on flanks, thighs and vent. VOICES. Very vociferous. Varied sounds from different flock-members combine to produce sudden, very loud outbursts of extended cackling laughter, typically involving rapid chattering and repetitive double-note phrases; outbursts often introduced by a few subdued "ow" or "u-ow" or "u-ah" notes, and often fade out, a single individual continuing to mutter subdued low notes such as staccato, hoarse "ker-wick-erwick". Sometimes less coordinated choruses spring up and peter out in seeming disorder.

**Habitat.** Broadleaf evergreen forest and mixed deciduous forest, disturbed, secondary and regenerating forest, scrub, bamboo-jungle, overgrown abandoned cultivation, plantations and gardens near forest; lowlands to 2135 m, typically below 1600 m.

**Food and Feeding.** Mainly insects, including beetles (of families Buprestidae, Elateridae, Rutelidae, Passalidae and Cerambycidae), and spiders (Araneae), berries and seeds; also small reptiles and flower nectar. Generally in lower to middle storeys. Forages mostly on ground, hacking at earth and tossing aside leaves in search of invertebrates; changes place in bounding hops. Noisy and gregarious at all seasons, in flocks of 6–12, sometimes up to 40, individuals, often associating with other (notably necklaced) laughingthrushes in bird waves; in Bhutan flocks of up to 20 occur Dec–Feb, but generally only up to five Mar–Jul and then up to ten Aug–Nov.

**Breeding.** Feb–Sept throughout main range; multi-brooded. Co-operative breeder. Nest reportedly a large, shallow, rough cup, made of coarse grasses, bamboo or other dead leaves, twigs, roots, moss, creeper, plant twigs, stems and tendrils, lined with rootlets (often black), coarse roots, plant flower stems and leaf stalks, placed c. 1–8–6 m above ground in shrub, bush or low tree. Clutch 2–6 eggs (usually 4–5 in India, 3 in S Myanmar), white or china-white; incubation by both sexes, period c. 14 days; nestlings fed by all group-members, may leave nest long before fully grown; no information on fledging period. Brood parasitism by Chestnut-winged Cuckoo (*Clamator coromandus*), Jacobin Cuckoo (*Clamator jacobinus*) and Large Hawk-cuckoo (*Cuculus sparverioideus*) reported.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common. Common and widespread in Nepal. In Bhutan abundant in the Sunkosh, C & E valleys, and in foothills, and present in Thrumshingla National Park; probably most abundant at 1000–1600 m, but at 1600–1900 m recorded density of 1 breeding pair/1 km of road. Common and widespread in NE India, where as many as 33–3 birds/km<sup>2</sup> in hill forest in Buxa Tiger Reserve (West Bengal), and present in Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (all Arunachal Pradesh), Kaziranga National Park (Assam), and Nongpui Wildlife Sanctuary and Dampa Tiger Reserve (Mizoram); in W of Indian range, seen intermittently in Rajaji National Park (Uttar Pradesh), disappeared in 1977 from New Forest campus at Dehra Dun, and uncommon in Dehra Dun valley, but common in Corbett National Park (Uttaranchal Pradesh). Locally common in SE Bangladesh. Common across SE Asian range. Common in Khao Yai National Park, in Thailand. Common in Cambodia at least before 1970. Common in Xe Pian National Biodiversity Conservation Area (NBCA), Phou Khaohay, Phou Xang He, Xe Bang Nouan and Dong Hua Sao NBCAs, in Laos, and in various other areas of the country, including part of Nakai-Nam Theun NBCA; and present in Phou Xiang Thong NBCA. In Vietnam, common in Cuc Phuong, Bach Ma and Nam Bai Cat Tien National

Parks, and present in Na Hang Nature Reserve, Chu Yang Sin Nature Reserve, and in twelve protected areas in the Annamese lowlands. Common feral resident in Singapore, originating from escaped captives.

**Bibliography.** Ali & Ripley (1948, 1971), Ali *et al.* (1996), Allen *et al.* (1997), Bangs (1921), Barua & Sharma (1999), Berlioz (1930), Betts (1956), Bingham (1903), Bingham & Thompson (1900), Birand & Pawar (2004), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Choudhury (2003), Collar (2006), Cox *et al.* (1992), David-Beaulieu (1932, 1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Eames & Ericsen (1996), Eames, Eve & Tordoff (2001), Eames, Steinheimer & Ros Bansok (2002), Engel (1981), Engelbach (1932, 1952), Evans & Timmins (1998), Evans *et al.* (2000), Fischer (1995), Garthwaite & Ticehurst (1937), Gibson (1982), Grimmett *et al.* (1998), Gyldestolpe (1916), Hill (2000), Hopwood (1912), Hopwood & Mackenzie (1917), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Jirle & Kjellén (1987), Katti *et al.* (1992), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lekagul & Round (1991), Ludlow & Kinnear (1944), Martens & Eck (1995), Mayr (1938), Meyer de Schauensee (1934, 1984), Mohan (1997), Neath (2001), Nguyễn Đức Tu *et al.* (2001), Pandey *et al.* (1994), Rasmussen & Anderton (2005), Rezanov (1987), Ripley (1952), Rippon (1901), Robinson & Kloss (1919a), Robson (2000), Robson, Buck *et al.* (1998), Robson, Eames, Nguyễn Cu & Trương Văn La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Round (2006), Seng Kim Hout *et al.* (2003), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounholine (1998), Singh, A.P. (2000), Singh, P. (1995), Sivakumar *et al.* (2006), Smythies (1986), Soucek & Vencel (1975), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Thomas & Poole (2003), Ticehurst (1933), Timmins & Rattanak (2001), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Turin *et al.* (1987), Vencel & Soucek (1976), Wang Shuzhen *et al.* (1983), Wickham (1929), Wiles (1980), Wood & Finn (1902), Young (1978), Zheng Zuoxin *et al.* (1983).

## 212. Black-and-white Laughingthrush

### *Garrulax bicolor*

French: Garrulaxe bicolore

German: Schwarzweißhäherling

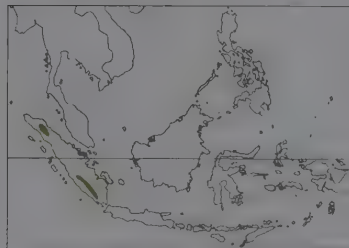
Spanish: Charlatán de Sumatra

Other common names: Sumatran Laughingthrush

**Taxonomy.** *G[arrulax]. bicolor* Hartlaub, 1844, western Sumatra.

Formerly treated as conspecific with *G. leucolophus*. Monotypic.

**Distribution.** Sumatra.



**Descriptive notes.** 24–28 cm. Head to breast, including upper lores, is white, with glossy black on forehead and over nares and joining, via lower lores, with black "goggles" and lower ear-coverts; entire rest of plumage sooty brown-black; iris reddish; bill black; legs black, greenish-black or slaty black. Differs from similar *G. leucolophus* (of nominate race) in smaller size, proportionately shorter tail, blackish colour of upperparts and lower underparts, differently shaped black mask with high black forehead, white of crown projecting down in front of eye, and black on ear-coverts much narrower. Sexes similar. Juvenile

is like adult, but with much white admixed on black underparts. Voice. No information.

**Habitat.** Broadleaf evergreen forest, at 750–2000 m; possibly slightly more montane than *G. leucolophus*.

**Food and Feeding.** No information. Probably much as for *G. leucolophus*.

**Breeding.** Dec–Apr. No further information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Avidly persecuted by bird-traders; easily removed from an area by means of trapping with the use of decoys. On Mt Kerinci the species has all but disappeared since 1985, and around the year 2000 the species could be found only at Sipurak, two days' hard walk from nearest road. Evidence that it may be in very serious trouble is that many individuals supposedly of this species now on sale in markets in Sumatra are, in fact, of the continental *G. leucolophus*, rather than of this endemic species. Present in Gunung Leuser National Park.

**Bibliography.** Berlioz (1930), Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Collar (2006), Kloss (1931), van Marle & Voous (1988), Meyer de Schauensee & Ripley (1940a), O'Brien & Kinnaird (1996), Parrot (1907), Robinson & Kloss (1919b, 1920, 1924b), Snouckaert van Schaumburg (1922).

## 213. Lesser Necklaced Laughingthrush

### *Garrulax monileger*

French: Garrulaxe à collier

German: Lätzchenhäherling

Spanish: Charlatán Acollarado Chico

Other common names: Necklaced/Black-necklaced Laughingthrush

**Taxonomy.** *Cinc[losoma]. Monilegera* [sic] Hodgson, 1836, Nepal.

Ten subspecies recognized.

#### Subspecies and Distribution.

*G. m. monileger* (Hodgson, 1836) – WC Nepal E to Bhutan, NE Indian states (except E Arunachal Pradesh and adjacent NE Assam), E Bangladesh, W & C Myanmar and S China (W Yunnan).

*G. m. badius* Ripley, 1948 – NE India (E & SE Arunachal Pradesh and Patkai Range, in E Assam) and extreme N Myanmar.

*G. m. stuarti* Meyer de Schauensee, 1955 – SE Myanmar (including extreme N Tenasserim) and NW Thailand.

*G. m. fuscatus* Stuart Baker, 1918 – NC & C Tenasserim (S Myanmar) and adjacent W Thailand.

*G. m. schauensei* Delacour & Greenway, 1939 – extreme E Myanmar, N Thailand, N Laos and S China (S Yunnan).

On following pages: 214. Greater Necklaced Laughingthrush (*Garrulax pectoralis*); 215. White-throated Laughingthrush (*Garrulax albobularis*); 216. Rufous-crowned Laughingthrush (*Garrulax ruficeps*); 217. Masked Laughingthrush (*Garrulax perspicillatus*); 218. Rufous-fronted Laughingthrush (*Garrulax rufifrons*); 219. Ashy-headed Laughingthrush (*Garrulax cinereifrons*); 220. Sunda Laughingthrush (*Garrulax palliatus*); 221. Black Laughingthrush (*Melanocichla lugubris*); 222. Bare-headed Laughingthrush (*Melanocichla calva*); 223. Spectacled Laughingthrush (*Rhinocichla mitrata*); 224. Chestnut-hooded Laughingthrush (*Rhinocichla treacheri*); 225. Chinese Babax (*Babax lanceolatus*); 226. Giant Babax (*Babax waddelli*); 227. Tibetan Babax (*Babax koslowi*).



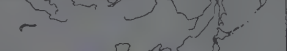
**Bibliography.** Ali & Ripley (1948, 1971), Ali *et al.* (1966), Allen *et al.* (1997), Barua & Sharma (1999, 2005), Berlioz (1930), Birand & Pawar (2004), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paoli (1960), Cox *et al.* (1992), David-Beautillac (1932, 1944, 1950), Deignan (1963), Delacour (1929), Delacour & Jabouille (1931a), Delacour *et al.* (1928), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Eames & Frison (1996), Eames *et al.* (2001), Engelbach (1932, 1952), Evans & Timmins (1998), Grimmeri *et al.* (1998), Gyldestolpe (1916), Hill (2000), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1888), Hume & Davison (1878), Hume & Oates (1889), Inskip & Inskip (1991), Inskip *et al.* (2000), Katti *et al.* (1999), King, B.F. & Iino Wataru (1989), King, B.F. & Zheng Guohua (1988), King, B.F. *et al.* (2001), King, D.I. & Rappole (2001), La Touche (1925–1930), Le Manh Hung *et al.* (2002), Le Xuan Canh *et al.* (1997), Lokugai & Round (1991), Lethwaite (1996), Ludlow & Kinneer (1944), Macdonald (1907), Meyer & Schauenstein (1984), Neath (2001), Nguyễn Đức Tu *et al.* (2001), Rasmussen & Anderton (2005), Riley (1938), Robbins *et al.* (2006), Robison & Kloss (1991a), Robson (2000), Robson, Eames, Nguyễn C. & Truong Van La (1993a), Robson, Eames,

## 214. Greater Necklaced Laughingthrush

*Garrulax pectoralis*

**Other common names:** Necklaced/Gorgeted/Black-gorgeted Laughingthrush

*G. n. semitorquatus* Ogilvie-Grant, 1900 – Hainan I.



Very like *G. monileger*, but larger, eye dark, necklace often bolder, dark primary coverts. Nominate race has crown and upperparts olive-tinged mid-brown, hindcollar and upper mantle rufescent, wing fringes and central tail feathers as upperparts but outer primaries fringed greyer, primary coverts darker than rest of wing, outer tail feathers blackish-brown distally with broad white tips; lores and side of forehead whitish to buff, narrow whitish postocular supercilium from eye to above rear of ear-coverts; ear-coverts whitish, variably

**Status and Conservation.** Not globally threatened. Local and uncommon in Nepal, becoming more frequent farther E. Occasionally recorded resident in foothills and C & E valleys in Bhutan, and present in Thrumshingla National Park. Frequent in India, where common in Nameri National Park (Assam), and present elsewhere in NE India in (at least) Buxa Tiger Reserve, in West Bengal, where as many as 25 birds/km<sup>2</sup> in monoculture plantation, also Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks, all in Arunachal Pradesh, Balphakram National Park, in Meghalaya, Barail Reserve Forest and Kaziranga National Park (common in latter), in Assam, and Ngengpui Wildlife Sanctuary and Dampa Tiger Reserve, in Mizoram. Fairly common and sometimes abundant in S China, where recorded in 19 (35%) of 54 surveyed sites (of which 52 are nature reserves); widespread but sparse population in Hong Kong of captive origin. Generally uncommon to common in SE Asian range. Present in Kaeng Krachan National Park, in Thailand. Present in the Nakai-Nam Theun National Biodiversity Conservation Area (NBCA) and in Phou



Dendin NBCA, in Laos. Fairly common in Tam Dao National Park, and present in three protected areas in the Annamese lowlands, in Vietnam.

**Bibliography.** Ali & Ripley (1948, 1971), Ali *et al.* (1996), Allen *et al.* (1997), Anon. (2004c), Bangs (1921), Barua & Sharma (1999, 2005), Berlioz (1930), Betts (1947), Bingham (1903), Bingham & Thompson (1900), Birand & Pawar (2004), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), Choudhury (2003), Christison *et al.* (1946), Corlett (1998), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Gyldestolpe (1916), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1888), Hume & Davison (1878), Hume & Oates (1889), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Jähne (2004), Jirle & Kjellén (1987), Katti *et al.* (1992), King, B.F. (1987), King, B.F. & Han Lianxian (1991), King, B.F. & Liao Weiping (1989), King, B.F. & Zheng Guangmei (1988), King, B.F. *et al.* (2001), King, D.I. & Rappole (2001), La Touche (1899, 1925–1930), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Ludlow & Kinnear (1937, 1944), Mayr (1938), Meyer de Schauensee (1946, 1984), Oates (1883), Rasmussen & Anderton (2005), Ripley (1952), Rippon (1901), Robson (2000), Robson *et al.* (1989), Round (1999), Singh (1995), Sivakumar *et al.* (2006), Smith *et al.* (1943), Smythies (1986), Spierenburg (2005), Stanford & Ticehurst (1930), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Timmins & Trinh Viet Cuong (1999), Ticehurst (1933), Tizard *et al.* (1997), Tordoff *et al.* (2002), Wickham (1929), Wiles (1980), Wood & Finn (1902), Wu Zhikang *et al.* (1986), Yu Zhiwei *et al.* (1986), Zhao Xiubi (1994), Zheng Zuoxin & Qian Yanwen (1973), Zhu Xi & Fan Houde (1995).

## 215. White-throated Laughingthrush

### *Garrulax albogularis*

**French:** Garrulaxe à gorge blanche **Spanish:** Charlatán Gorjiblanco  
**German:** Weißkehhlhäherling  
**Other common names:** Collared Laughingthrush

**Taxonomy.** *Ianthocincla albogularis*. Gould, 1836, Nepal. Closely related to and often treated as conspecific with *G. ruficeps*. Birds from NW Himalayas described as race *whistleri*, those from SW Sichuan (SC China) as *aetus* and those in rest of China as *eous*; distinguishing characters (including mensural differences), however, extremely weak, and naming of geographical races considered unwarranted. Treated as monotypic.

**Distribution.** NE Pakistan (Murree Hills, at least formerly) E to Uttarakhand Pradesh, Nepal, Bhutan and NE India (C Arunachal Pradesh), adjacent S & SE Xizang, SC & S China (W, S & extreme NE Yunnan E through C & NE Sichuan to S Gansu, S Shaanxi and W Hubei; reportedly also in Xining region of E Qinghai, in NC China) and extreme NW Vietnam (W Tonkin).



**Descriptive notes.** 28–30.5 cm; 78–150 g. Rather large, dull brown laughingthrush with white breast, rufescent-buff lower underparts and broad white tail tips. Has lower forehead to eye dull rufous, crown and upperparts rufescent-tinged olive-brown, upperwing and central tail similar but inner primaries fringed olive-greyish, outer primaries fringed pale grey, outer tail feathers with increasingly bold white tips and darker subterminally; lores to cheek blackish, ear-coverts as crown; chin black, throat to upper breast white, band across breast brownish-grey, continuous with but slightly paler and greyer than upperparts,

broadly at breast side, sharply divided from white but shading to ochraceous buff on rest of underparts; iris dull white through blue-grey to dark brown, orbital/facial skin lead-grey; bill horn-brown to black, sometimes paler tip; legs slaty blue to dirty slate. Sexes similar. Juvenile is rather warmer above than adult, with little rufous on forehead, orbital skin greenish-yellow or greenish-olive, less pronounced breastband and whitish mid-belly, bill blackish-olive, darker above, mouth orange-yellow, gape yellow. Voice. Thin shrill wheezy whistles, e.g. "tsu'ueeeee", "hiuuuu", "huiiii" and "hsiii"; gentle "chrrrr", soft "teh" notes and subdued chattering when foraging; harsh forced "chrrr-chrrr-chrrr..." when alarmed. Alternatively, calls described as loud, jarring, squeezed-out, rich, clear, whistled "kleéééééé" (falls slowly and dies away), sometimes ending with purring, and dry hissing "hséééééé". Also, an irregular, nervous chattering, "chit, chit it it it" (usually interspersed quickly among other notes), sometimes run together very rapidly in excited, spluttering purr, "chrrr'r'r'r'r'r'r'r, chrrr'r'r'r". Flock calls become higher and shriller with excitement.

**Habitat.** Broadleaf evergreen forest, deciduous forest and coniferous forest, open secondary growth, scrub and light jungle, occasionally entering fields, at 300–3800 m; breeding mainly above 1200 m, with some descent from highest levels during spells of harsh weather. In Bhutan, replaced at lower elevations by *G. leucolophus*.

**Food and Feeding.** Mainly insects; outside breeding season also berries and seeds. Gregarious, even in breeding season, occurring in flocks of 6–15 individuals; flocks of up to 150 in non-breeding season (mean winter flock size in Bhutan 60, falling to 20 in Mar–Apr); often in association with other species (including other laughingthrushes) in bird waves. Often feeds on ground; also in middle storey, where searches crevices of bark and tears off lumps of moss.

**Breeding.** Mar–Jul. Nest a broad shallow saucer to moderately deep cup, made of coarse dry grasses, dead bamboo or other leaves, ivy twigs with leaves attached, orchid leaves, creepers, twigs, roots, moss and lichen fibres, often well lined with rootlets, moss roots, red and black fern roots and fibres (but sometimes unlined), placed 1–4 m, occasionally up to 6 m, above ground in bush, shrub, sapling or horizontal tree branch. Clutch 2–4 eggs (usually 3 in India), deep dull blue to deep intense greenish-blue; nestlings may leave nest long before full grown. No other information.

**Movements.** Resident and minor partial altitudinal migrant. In Bhutan moves from 1400–3200 m in summer to below 2800 m, occasionally down to 800 m, in winter.

**Status and Conservation.** Not globally threatened. In Pakistan, rare and local, possibly now extinct. Common and widespread in Nepal. Abundant in Bhutan, where present in Thrumshingla National Park. Locally frequent in India, including in Corbett National Park, in Uttarakhand Pradesh, but uncommon in Dehra Dun valley (also Uttarakhand), and seen intermittently in Rajaji National Park, in Uttar Pradesh; although generally very rare in NE hills, very common in vicinity of Eaglenest Wildlife Sanctuary, in Arunachal Pradesh. Fairly common to locally common in China. Uncommon in W Tonkin, in Vietnam.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Anon. (2004c), Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), Cheng Tsohsin *et al.* (1963), Choudhury (2003), Collar (2006), Delacour & Jabouille (1931a), Duckworth *et al.* (1998), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Islam (1993), King (1989a), Li Guiyuan, Liu Yangjun *et al.* (1993a), Li Guiyuan & Jia Guoqian (1993), Li Guiyuan & Wei Xingjun (1993), Ludlow & Kinnear (1944), Martens *et al.* (1995), Meyer de Schauensee (1984), Oldenettel (1994), Pandey *et al.* (1994), Rasmussen & Anderton (2005), Robson (2000), Sien Yaohua *et al.* (1964), Singh, A.P. (2000), Singh, P. (1995), Spierenburg (2005), Stevens (1923), Stuart Baker (1893), Vaurie (1954b), Wang Zhijun & Wei Tianhao (1983), Yu Zhiwei *et al.* (1986), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983).

Eck (1995), Meyer de Schauensee (1984), Oldenettel (1994), Pandey *et al.* (1994), Rasmussen & Anderton (2005), Robson (2000), Sien Yaohua *et al.* (1964), Singh, A.P. (2000), Singh, P. (1995), Spierenburg (2005), Stevens (1923), Stuart Baker (1893), Vaurie (1954b), Wang Zhijun & Wei Tianhao (1983), Yu Zhiwei *et al.* (1986), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983).

## 216. Rufous-crowned Laughingthrush

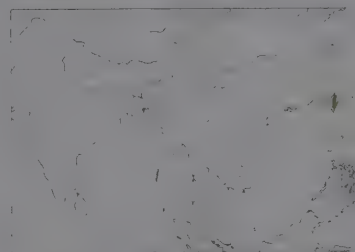
### *Garrulax ruficeps*

**French:** Garrulaxe à calotte rousse **Spanish:** Charlatán Coronirrufo  
**German:** Rotkappenhäherling

**Taxonomy.** *Garrulax ruficeps* Gould, 1863, Taiwan.

Closely related to and often treated as conspecific with *G. albigularis*. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 27–29 cm. Has crown to nape dull orange-tinged rufous, slightly less intense on nape, where shifting to milky buff-brown, with milky-brown upperwing and tail, outer primary fringes pale brown, tail with large white tips on all except central feathers; small loreal area and upper cheek sparsely feathered blackish, lower cheek and ear-coverts milky buff-brown; chin black, submoustachial area, throat, upper breast and neck sides white, cutting neatly to narrow milky-brown breastband, shading to buffy white on mid-belly to vent and to grey-tinged buffy ochre on flanks and thighs; iris brown or brownish-red, orbital

skin dark grey; bill dusky grey, paler edges and tip. Differs from very similar *G. albigularis* mainly in having forehead to nape dull orange-rufous, upperparts slightly more buff-tinged, breastband much narrower, lower underparts whitish with grey-buff flanks, bill slightly longer, wing and tail shorter, much larger white tail tips. Sexes similar. Juvenile apparently undescribed. Voice. Very similar to that of *G. albigularis*. Weak twittering contact notes and occasional thin, penetrating, shrill, rising "tsuuiiii", "tsuuiii" or "dzuiii".

**Habitat.** Primary forest of oak, fir and cedar, open secondary growth, scrub, occasionally entering fields; at 850–2300 m.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Typically in pairs or in flocks of 15–20 individuals; often in association with Eurasian Jay (*Garrulus glandarius*). Forages in lower to middle strata.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Sparse to fairly common, although habitat relatively restricted. Listed as "Near-threatened" in a national red list.

**Bibliography.** Anon. (2004d), Berlioz (1930), Cheng Tsohsin (1987), Collar (2004, 2006), Hachisuka & Udagawa (1950, 1951), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Yen Chungwei (1990)

## 217. Masked Laughingthrush

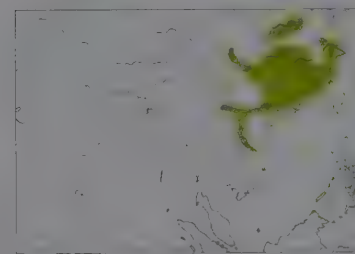
### *Garrulax perspicillatus*

**French:** Garrulaxe masqué **German:** Maskenhäherling **Spanish:** Charlatán Enmascarado  
**Other common names:** Black-faced/Spectacled Laughingthrush, Masked Jay-thrush

**Taxonomy.** [*Turdus*] *perspicillatus* J. F. Gmelin, 1789, Amoy, Fujian, China.

Has sometimes been placed in genus *Dryonastes*. Monotypic.

**Distribution.** E & SE China in S Shaanxi, S Shaanxi and N Henan, and from SC Sichuan E to Shanghai, and SE Yunnan E to Fujian and Guangdong; also Vietnam (S to C Annam).



**Descriptive notes.** 28–31.5 cm; 100–132 g. Large laughingthrush, dull plain grey-brown above and greyish-buff below, with greyish head and large blackish mask. Forehead, lores, area above and below eye and ear-coverts are blackish, forehead ochrous mid-grey, shading to mid-grey on rest of crown and drab mouse-brown on upperparts, with rump and uppertail-coverts tinged ochrous; upperwing and tail mid-brown, latter slightly rufescent and with outer feathers shading blackish-brown distally; chin, throat and upper breast pale brownish-grey with vague sooty-brown mottling, mid-breast plain dirty buff, becoming

warmer on belly and rufescent buff on vent, dusky on flanks; iris dark brown to rufous-brown; bill dark horn, blackish-brown or dusky, paler towards tip; legs pale greyish-brown to reddish-brown. Sexes similar. Juvenile has fainter mask, crown and nape browner-tinged, lower mantle and back warmer, throat and breast browner, and wings warmer overall. Voice. Song a noisy set of grunting, chuckling and babbling notes. Typical calls include loud "jhew" or "jhow" notes (often doubled) and harsh chattering.

**Habitat.** Scrub and woodland, cultivated areas, often near villages, thickets, bamboo, reeds, hedgerows; lowlands to 1000 m. Not particularly linked with forest, and in Hong Kong associated with built-up urban areas, parks, villages, farmland and degraded open storage areas.

**Food and Feeding.** Invertebrates, including grasshoppers (Orthoptera), grubs, and snails, also seeds and fruit; group once observed attempting to kill frog. Found in parties, often families, of 6–12 individuals; rather skulking, but often quite noisy. Forages mainly on ground and under thick growth.

**Breeding.** Mar–Aug; multi-brooded. May be co-operative breeder. Nest a large, crude, untidy cup, made of sticks, weed and grass stems, bamboo and other leaves, leaf skeletons, strips of bark, creeper stems, shreds of paper and poultry feathers, lined with mud, roots, twigs, grass and pine needles, placed 1–9 m above ground in thick hedge or bush, brambles (*Rubus*), briars (*Rosa*), bamboo, tall grass, reeds or tree. Clutch 2–4 eggs (usually 3–4 in China), pale buff, suffused with greenish-white or greyish-tan. Sometimes with (and reddish-brown) blotches, sometimes with a blunt end (Guizhou); one nest in China said to contain 3 eggs of this species and 2 of *Pterorhinus saminio*. No other information available.



**Movements.** Resident. Minor altitudinal movements reported require substantiation.

**Status and Conservation.** Not globally threatened. Locally common. In China, at least formerly abundant in Yangtze Valley, and abundant and widespread in Hong Kong. Present in Maershan Nature Reserve, in Guangxi. Generally fairly common in Vietnam, where present in Na Hang Nature Reserve, and in seven protected areas in the Annamese lowlands, occurs also on the outskirts of Bach Ma National Park.

**Bibliography.** Anon. (2004c), Berlioz (1930), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chalmers (1988), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Corlett (1998), Cox *et al.* (1992), Eames & Ericson (1996), Eames *et al.* (2001), Herklots (1974), Hill (2000), Jirle & Kjellén (1987), Kaiser (1983), King (1987), Kinnear (1929), La Touche (1906, 1925–1930), Lee Kwok Shing *et al.* (2006), Lewthwaite (1996), Liu Kezhi *et al.* (1994), Liu Rong *et al.* (2002), Meyer de Schauensee (1984), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Vaurie (1954b), Viney *et al.* (1994), Vo Quy (1971), Wu Zhikang *et al.* (1986), Yealland (1965), Yen Kwokying (1934a, 1934b), Zhao Xiubi (1994), Zheng Zuoxin & Qian Yanwen (1973).

## 218. Rufous-fronted Laughingthrush

### *Garrulax rufifrons*

**French:** Garrulaxe à front roux **German:** Rotstirnhäherling **Spanish:** Charlatán Frentirrufo  
**Other common names:** Red-fronted Laughingthrush

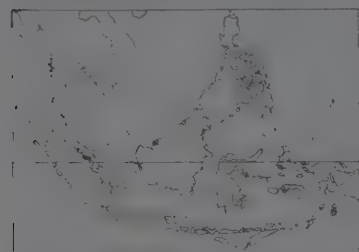
**Taxonomy.** *Garrulax rufifrons* Lesson, 1831, Mount Salak, west Java.

Two subspecies recognized.

**Subspecies and Distribution.**

*G. r. rufifrons* Lesson, 1831 – W Java.

*G. r. slamatensis* Siebers, 1929 – Mt Selamat, in C Java.



**Descriptive notes.** 27 cm. Fairly large, featureless laughingthrush, greyish-brown with dull chestnut forehead and lores. Nominative race has forehead, lores and area above and below eye dull chestnut, upperparts greyish mid-brown, warmer and darker lower down and on upperwing and tail, with chestnut bases of primaries (visible in flight); uppermost chin dull chestnut, rest of chin, throat and breast pale buffy grey, with faint rufous-chestnut markings on chin and upper throat (sometimes forming faint malar lines), underparts rufescent buff-tinged mid-brown, becoming darker and duller on flanks, lower belly and vent; iris pale

yellow-orange to whitish-yellow, orbital skin dull yellowish-green; bill black, paler tip; legs dark greyish-brown or greenish-brown. Sexes similar. Juvenile apparently undescribed. Race *slamatensis* is slightly rufous-tinged above, strongly washed dull chestnut below and on ear-coverts. **VOICE.** Calls include subdued but harsh “kheh” or “queek” notes, quickly repeated, stressed “hii” and “tii” notes in quick combinations, “hii-tii-hii-hii-tii...”, and, when agitated, nervous chuckling, tinkling “hi-tu-tu-tu-tu-tu...”, or “hihi-hu-hu-hu-hu-hu-hu...” (15–30 or more notes).

**Habitat.** Broadleaf evergreen forest, at 900–2500 m.  
**Food and Feeding.** Berries and insects; insects mostly beetles (Coleoptera, of many families), also mantids, caterpillars, etc. Forages typically in noisy groups of up to 15 individuals; associates also with bird waves.

**Breeding.** May–Jun and Sept in W Java. Nest reportedly a solid cup, placed in horizontal branch fork not far above ground. Clutch 2–3 eggs, blue-green. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Java and Bali Forests EBA. Uncommon. Fairly heavily exploited as a cagebird, which has rendered it uncommon in otherwise moderately secure habitat. Formerly common in Gunung Gede-Pangrango National Park, in W Java, but now rare along main trail, reportedly as a consequence of trapping.

**Bibliography.** Andrew (1985), Anon. (2006d), van Balen (1992), Berlioz (1930), Butchart & Stattersfield (2004), Collar *et al.* (2001), Hoogerwerf (1950a), MacKinnon (1988), Sody (1956), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Voous (1948).

## 219. Ashy-headed Laughingthrush

### *Garrulax cinereifrons*

**French:** Garrulaxe à tête cendrée **German:** Graustirnhäherling **Spanish:** Charlatán Cabecigris

**Taxonomy.** *Garrulax cinereifrons* Blyth, 1851, Sri Lanka.

Monotypic.

**Distribution.** SC & SW Sri Lanka.



**Descriptive notes.** 24–25 cm; 70 g. Rather featureless medium-sized laughingthrush, dull chestnut-brown above and buffy brown below, with dull grey head and pale eye. Lores, crown and neck side are slightly bluish mid-grey, shading on nape to dull chestnut-brown of upperparts, upperwing and tail; wing with pale brown fringes; ear-coverts slightly paler and shinier grey than crown; chin and mid-throat pale buff, shading on lower throat to warm buff, underparts buffy chestnut-brown, slight grey wash on breast, mid-belly paler; iris white, sometimes with greyish, yellowish or reddish tinge; bill black, lower mandible sometimes

paler; legs lead-brown. Sexes similar. Juvenile is warmer overall than adult, with less extensive grey on crown, dull grey iris with dark outer ring. **VOICE.** Continuous, rather high-pitched squeaky notes and harsher churring sounds, harsh “cherrrr” or “chraaaa” or “cheererrrr”, interspersed with sharper “chit” notes and occasionally a higher-pitched “pieu pieu”. Calls described also as very low, “moo, shuffline ‘bur’-rrr” like the snorting of a horse, which may be combined with selection of hoarse, croaked, short staccato squeaks, guffaws, short titters, chuckles, whinnies, sharp metallic notes, and harsh nasal or wheezy mew. Flocks call almost constantly while on the move.

**Habitat.** Shaded understorey of undisturbed broadleaf evergreen forest, bamboo; usually keeps to interior and away from forest edge, although at one site a few were seen in abandoned “chena” cultivation. Found at up to 1200 m, locally 1525 m.

**Food and Feeding.** Caterpillars, bugs (Hemiptera), beetles (Coleoptera), grubs, small snails, fruit and seeds. Food delivered to nest mostly insects, including small caterpillars, moths (Lepidoptera) and grasshoppers (Orthoptera). Forages in monospecific flocks of 4–20 individuals or in bird waves, which often include *Turdoides rufescens*. Foraging flocks often fan out to feed on or near ground in low vegetation and among leaf litter, but also explore mossy fallen tree trunks; main technique is gleaning from leaves.

**Breeding.** Probably mainly Mar–Aug, but male gonadal development recorded in Sept and Nov, and three nests found Nov–Dec, so that all-year breeding likely. Partly social breeder. Nest a large, outwardly untidy mass of twigs and leaves with neat internal cup, externally made of dead leaves and twigs, internally of pliable twigs, rootlets and horsehair lichen, placed up to 5 m above ground in bush or fork of small tree. Clutch 3–4 eggs, turquoise-blue; incubation period 14–15 days; at one nest, full clutch (3 eggs) was laid within 24 hours, suggesting that more than one female was responsible, at least two birds incubated while other five group-members remained within a radius of c. 100 m (smaller than usual ranging area) and, at hatching, at least three attended nest, and all group-members fed chicks in sequence, the last one then brooding them; no information available on nestling period. Nest predation evidently frequent; Sri Lanka Blue Magpie (*Urocissa ornata*) is one suspected culprit.

**Movements.** Resident.

**Status and Conservation.** **VULNERABLE.** Restricted-range species: present in Sri Lanka EBA. Global population estimated at 2500–9999 individuals (probably at lower end of this range) and decreasing; occupied range estimated at 15,800 km<sup>2</sup>. Always judged a low-density species; even so, monospecific flocks in 19th century reported to hold 10–20 individuals, whereas in 1997 none was seen to contain more than six (although later study found mean group size of 7.2). Moreover, of 38 recorded localities, only twelve known to be occupied since 1980, in C & S of range; during survey of more than 200 forest sites in 1991–1996, recorded in only six forests. Nevertheless, still a common member of mixed-species flocks, with 91% of records from such flocks and present in 47% of these flocks. Main threat is extensive clearance and degradation of forests, particularly in wet zone, through logging, fuelwood-gathering, conversion to agriculture and tree plantations, gem-mining, settlement and fires. May be particularly vulnerable to habitat loss and fragmentation, as it is confined to interior of forest blocks and is probably unable to move between isolated patches. Some protected forests continue to be degraded and suffer further fragmentation. A moratorium was passed in 1990 to protect wet-zone forests from logging. The species is legally protected in Sri Lanka. It occurs in several national parks and forest reserves, most notably Sinharaja Forest Reserve.

**Bibliography.** Ali & Ripley (1972), Anon. (2006d), Banks & Banks (1986, 1987), Butchart & Stattersfield (2004), Collar *et al.* (2001), Fleming (1977), Grimmett *et al.* (1998), Harrison (1999), Henry (1998), Hoffmann (1984), Jayarathna *et al.* (2005), Jayasekara *et al.* (2003), Jones *et al.* (1998), Kotagama & Fernando (1994), Kotagama & Goodale (2004), Legge (1880), Phillips (1978), Rasmussen & Anderton (2005), Siriwardhene (2004), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Warakagoda (2003).

## 220. Sunda Laughingthrush

### *Garrulax palliatus*

**French:** Garrulaxe mantelé **German:** Schieferhäherling **Spanish:** Charlatán de la Sonda  
**Other common names:** Grey-and-brown/Catbird Laughingthrush

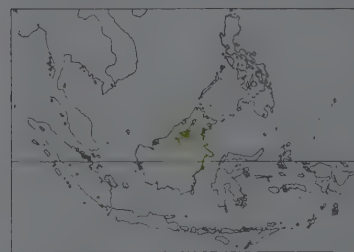
**Taxonomy.** [*Janthocincla*] *palliatus* Bonaparte, 1850, Sumatra.

Two subspecies recognized.

**Subspecies and Distribution.**

*G. p. palliatus* (Bonaparte, 1850) – Sumatra.

*G. p. schistochlamys* Sharpe, 1888 – N & NC Borneo.



**Descriptive notes.** 24–25 cm. Dull slate-grey medium-sized laughingthrush with black face and dull chestnut back and wings. Nominative race has crown to mantle dull slate-grey, lower mantle, back and scapulars dull chestnut-brown, wing fringes and tail dark brown; bristly lores and cheek black, rear ear-coverts and neck side as mantle; chin to submoustachial area as mantle with sooty-blackish streaks radiating in narrow lines onto mid-grey throat, which shades back to slate-grey on upper breast to lower belly; flanks, thighs and vent dull rufescent-tinged darkish brown; iris deep dull red to brown or grey, fairly large eyering pale

silvery blue; bill black; legs brownish-black or greyish-black. Sexes similar. Juvenile has grey of mantle and back mixed with brown, no streaking on throat, flanks to vent duller, iris dark grey. Race *schistochlamys* has back slate-grey, wing fringes and tail darker than nominate, less black on face and ear-coverts, richer chestnut-tinged flanks to vent. **VOICE.** Flock “songs” start gently with “yieu, yieu” (sometimes interspersed with “ydidit” or “yirdrt”), speeding up into raucous, bubbling, tumbling chaos of sound (screeching, chattering laughter), then easing into either “wikachwakachwikadiwik”, 4–30 quickly repeated “wiku” notes, or flowing “wipuwipuwipuw” etc. Grating, rattling, churring sounds also given, as well as sibilant soft, yelping, contact calls, e.g. “yo, yo, yo...”, “jieu, jieu”, “yuk, yuk”, “jup, jup”, “jip”.

**Habitat.** Broadleaf evergreen forest, sometimes secondary growth but with preference for primary forest; at 850–2200 m in Sumatra, 305–2010 m in Borneo.

**Food and Feeding.** Insects, including beetles (Coleoptera), moths and caterpillars (Lepidoptera), mantids; also seeds and other vegetable matter, including fruits of *Macaranga* and *Mallotus*. Found in flocks of up to twelve or more individuals, sometimes in association with other species, including *Melanerchia calva*. Forages in low vegetation and on ground, flicking over big leaves with bill, and will drop to ground to pick up invertebrates disturbed by tree-shrews (*Tupaia*); generally forages lower than does *Rhinocichla treacheri*. In Mount Kinabalu National Park (N Borneo) hunts moths around lights at dawn.

**Breeding.** Mar–Apr in Sumatra and Dec–Mar in N Borneo (Sabah). Evidence from playback of recorded song suggests group territoriality. Nest a well-made cup of fibres with finer lining material. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Bornean Mountains EBA and Sumatra and Peninsular Malaysia EBA. Fairly common. Occurs in Mount



Kinabalu National Park (Sabah) and Kayan Mentarang National Park (E Kalimantan), in Borneo, and in Gunung Leuser National Park, in Sumatra.

**Bibliography.** Berlioz (1930), Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Davison (1992), Holmes (1997), Kloss (1931), MacKinnon & Phillips (1993), van Marle & Voous (1988), Parrot (1907), Robinson & Kloss (1918, 1924b), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield *et al.* (1998).

## Genus *MELANOCICHLA* Sharpe, 1883

### 221. Black Laughingthrush

#### *Melanocichla lugubris*

French: Garrulaxe noir

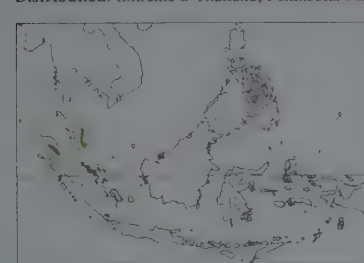
German: Trauerh herling

Spanish: Charlat n Negro

**Taxonomy.** *Timalia lugubris* S. M ller, 1836, Sumatra.

Genus traditionally subsumed in *Garrulax*, but exhibits some morphological and vocal differences. Forms a superspecies with *M. calva*, and formerly treated as conspecific. Monotypic.

**Distribution.** Extreme S Thailand, Peninsular Malaysia and Sumatra.



duller than adult, particularly on mantle and wing-coverts, with neck skin dark blue. Voice. Song, typically by at least two birds at once, consists of amazing loud hollow whooping "huup-huup-huup..." and rapid loud "okk-okk-okk-okk...", accompanied by harsh "awh" or "aak" notes; very similar to that of *M. calva*.

**Habitat.** Broadleaf evergreen forest, disturbed forest, forest edge, treefall light-gaps, secondary growth, at 500–1600 m; above 800 m in Peninsular Malaysia.

**Food and Feeding.** Insects, including curculionid and other beetles, ants (Formicidae), grasshoppers and crickets (Orthoptera), and caterpillars; also spiders (Araneae), and some seeds. Forages in pairs or small flocks, sometimes in association with bird waves. Usually close to ground, sometimes up to 9 m in trees. Chisels away at rotten branches to locate food.

**Breeding.** Oct–Apr. One nest was a bulky cup made of vegetable fibres and leaves, loose and ragged outer layer decorated with green moss and bound with roots, epiphyte stems and coarse fibres, and clearly defined, neater inner core and lining of interlaced dried bamboo leaves and blackish fibres probably from dudok palm (*Caryota aequatorialis*), placed c. 2.5 m up in fork of slender sapling on steep bank by jungle stream. Clutch 2 eggs, pale blue with small irregular charcoal spots and smudges. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Generally uncommon in S Thailand and Peninsular Malaysia; fairly common at Bukit Fraser (Peninsular Malaysia). Present in Gunung Leuser National Park, in Sumatra.

**Bibliography.** Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Collar (2006), Davison (1992), Gibson-Hill (1950), Harrap (1992), Madoc & Allen (1952), van Marle & Voous (1988), Medway (1972), Medway & Wells (1976), O'Brien & Kinnaird (1996), Robinson (1928), Robson (2000), Sheldon *et al.* (2001), Stattersfield *et al.* (1998).

### 222. Bare-headed Laughingthrush

#### *Melanocichla calva*

French: Garrulaxe chauve

German: Kahlkopfh herling

Spanish: Charlat n Calvo

**Taxonomy.** *Alloctops calvus* Sharpe, 1888, Kinabalu, north Borneo.

Genus traditionally subsumed in *Garrulax*, but exhibits some morphological and vocal differences. Forms a superspecies with *M. lugubris*, and formerly treated as conspecific. Monotypic.

**Distribution.** N Borneo.



yellow. Sexes similar. Juvenile has crown feathered to bill base. Voice. Song a series of 5–22 quite deep, flat-toned, resonant "ooh" notes, fairly evenly delivered but sometimes faltering a little (varied spaces between notes), "ooh-ooh-ooh-ooh-ooh-ooh...", each series repeated after short interval. In duet, "ooh" notes (of presumed male) are combined with strange, comical repeated "yow-yow" or "woh-woh" (from presumed females), the notes being loud and stressed, with high-pitched yelping quavering "ooh-yow-yow-ooh, yow-yow-ooh, yow-yow..."; another accompanying call (from presumed females) is low, harsh, mewling "weeah" given in combination with "ooh" or "ooh" and "yow-yow" notes, e.g. "ooh-yow-yow ooh-yow-yow... weeah-weeah..." or "ooh-ooh-ooh-ooh... weeah-weeah". In flocks constantly gives single bleat as contact. Vocally very similar to *M. lugubris*.

**Descriptive notes.** 25.5–27 cm. Medium-sized blackish laughingthrush with bare bluish-white postocular patch and heavy orange-red bill. Crown, face and upper throat are glossy black, feathers around bill base bristly and those on mid-crown rather sparse; entire rest of plumage dull blackish-grey, tail and inner webs of wing feathers blacker; iris brown to hazel, or blue with brown edge, orbital skin bluish-slate to violet, postocular skin bluish-white; bill orange to reddish-orange; legs brownish-grey to dirty dark green; blue to violet skin on side of throat/neck sometimes visible when vocalizing. Sexes similar. Juvenile is browner and

**Habitat.** Broadleaf evergreen forest, and secondary and disturbed forest, at 800–1800 m.

**Food and Feeding.** Crickets (Orthoptera), cicadas (Cicadidae) and other insects. Found in pairs or small parties, sometimes associating with other species in bird waves. In lower and middle storeys. Creeps about in trees rather sluggishly, foraging especially in columns of vegetation formed by dense vertical creepers around tree trunks, and able almost to free-fall through creepers, using feet to grasp occasionally at perch, in pursuit of falling insects; can hang upside-down like a giant titmouse (Paridae). Gleans ants (Formicidae) from bamboo twigs and larger insects from bamboo leaves.

**Breeding.** Juv in Oct and possible juv in Aug. Evidence from playback of recorded song suggests group territoriality. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Bornean Mountains EBA. Local and uncommon on Mt Kinabalu, and scarce in Kelabit Highlands; common on Mt Dulit.

**Bibliography.** Banks (1937b), Collar (2006), Gore (1968), Harrap (1992), MacKinnon & Phillips (1993), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999), Stattersfield *et al.* (1998).

## Genus *RHINOCICHLA* Sharpe, 1883

### 223. Spectacled Laughingthrush

#### *Rhinocichla mitrata*

French: Garrulaxe mitr 

German: Spiegelh herling

Spanish: Charlat n Mitrado

**Other common names:** Chestnut-capped Laughingthrush

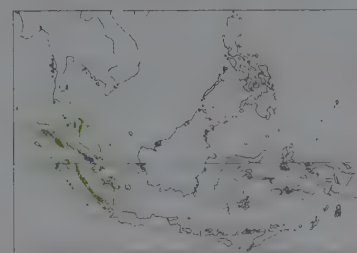
**Taxonomy.** *Timalia mitrata* S. M ller, 1836, Sumatra.

Genus traditionally subsumed in *Garrulax*, but exhibits some morphological differences. Forms a superspecies with *R. treacheri*, and hitherto treated as conspecific. Two subspecies recognized.

**Subspecies and Distribution.**

*R. m. major* Robinson & Kloss, 1919 – extreme S Thailand and Peninsular Malaysia.

*R. m. mitrata* (S. M ller, 1836) – Sumatra.



**Descriptive notes.** 22–24 cm. Medium-sized dull grey laughingthrush with yellow bill and legs, white eyering, chestnut on head and vent and bold white wing flash. Nominant race has lores, narial feathering, supercilium and crown chestnut, pointed feathers of forecrown whitish-grey, variable extent of blackish on forehead of face; ear-coverts, neck side, nape and upperparts slightly ochraceous mid-grey, upperwing and tail slightly darker, long white wingpanel on outer primaries, tail with blackish tip; area under white eyering, upper submoustachial area and chin blackish, throat to upper belly mid-grey with ochre tinge

(slightly stronger tinge than on upperparts), flanks darker, lower belly, thighs and vent rufous-chestnut; iris usually red, often red-brown or chestnut, sometimes brown or dark brown, orbital skin white, often with slight grey-blue tinge; bill deep yellow to orange; legs pale yellow to dark orange. Sexes similar. Juvenile is duller and browner than adult, with reduced white streaking on forehead. Race *major* is larger, larger-billed and more strongly ochraceous, notably below, than nominate. Voice. Song fairly subdued but clear and quite shrill, phrases consisting of 3–5 notes, "wi, wu-wi-wu-wi" and "wi, wu-wi" with stressed first note, "wi-wu-wu-wu-wi" with stressed middle note, and "wiu-wu-wu-wi" with rather sharp last note. Calls include sibilant "ju-ju-ju-ju-ju" and "wi-jujujujuju", rapid harsh squirrel-like cackling "wikakakaka", and other low, harsh sounds.

**Habitat.** Broadleaf evergreen forest, forest edge, disturbed and secondary forests and adjoining cultivation, low growth in old rice fields, generally at 900–3200 m; locally down to 500 m in Sumatra.

**Food and Feeding.** Insects, including cassidid and tenebrionid beetles, cockroaches (Blattodea), grasshoppers and crickets (Orthoptera), earwigs (Dermaptera), ants (Formicidae) and caterpillars; also small snails; in addition, fruit, berries and seeds, including chilli (*Capsicum*). Found in pairs or in parties of 4–5 individuals, or in larger flocks, sometimes in association with other species, including other laughingthrushes (and other babblers), in bird waves. Forages in lower and middle storeys, actively working through creepers and thicker foliage, sometimes ascending into taller trees.

**Breeding.** Mar–May in Peninsular Malaysia and Feb–Mar in Sumatra. Nest in one instance a shallow but solid cup of roots and fibres, placed c. 5 m up in tangle of fern fronds hanging from small tree. Clutch 2 eggs, white to deep greenish-blue. No information on incubation and nesting periods. Brood parasitism by Large Hawk-cuckoo (*Cuculus sparveriioides*) occurs in Peninsular Malaysia.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common in Peninsular Malaysia, where present in Cameron Highlands, Bukit Fraser and Taman Negara National Park. Present in Gunung Leuser National Park, in Sumatra, and common on Mt Kerinci.

**Bibliography.** Buij *et al.* (2006), Chasen & Hoogerwerf (1941), King *et al.* (1975), Madoc (1956), van Marle & Voous (1988), Medway (1972), Medway & Wells (1976), Robinson (1928), Robinson & Kloss (1918, 1924b), Robson (2000).

### 224. Chestnut-hooded Laughingthrush

#### *Rhinocichla treacheri*

French: Garrulaxe de Treacher

German: Kastanienkappenh herling

Spanish: Charlat n de Treacher

**Other common names:** Chestnut-capped Laughingthrush

**Taxonomy.** *Ianthocincla treacheri* Sharpe, 1879, Kinabalu, north Borneo.

Genus traditionally subsumed in *Garrulax*, but exhibits some morphological differences. Forms a superspecies with *R. mitrata*, and hitherto treated as conspecific. Individuals of this species re-



corded in W & SE Borneo (SW Sarawak and SE Kalimantan) apparently not yet assigned to race.

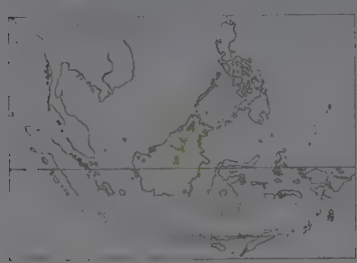
Three subspecies recognized.

#### Subspecies and Distribution.

*R. t. treacheri* (Sharpe, 1879) – N Borneo (Sabah).

*R. t. damnata* Harrison & Hartley, 1934 – NC Borneo (E Sarawak and adjacent NE Kalimantan).

*R. t. griswoldi* J. L. Peters, 1940 – Mt Batu Tibang (Sarawak–Kalimantan border), in C Borneo.



**Descriptive notes.** 22–24 cm. Nominate race has chin, area around bill base, lores, narial feathering and supercilium chestnut, forehead, forecrown and area from chin to below eye darker chestnut, pointed feathers of forecrown greyish-white; neck side and upperparts slightly ochraceous mid-grey, upperwing and tail slightly darker, long white wingpanel on outer primaries, tail with blackish tip; throat, breast and upper belly dull greyish-tinged buffy ochre with dull buffy shaft streaks, flanks greyer, lower belly, thighs and vent rufous-chestnut; iris red to reddish-brown, bright yellow orbital skin below and behind eye; bill yellowish-brown to dull orange; legs dirty yellow to yellow. Differs from very similar *R. mitrata* in having narial feathering, lores and supercilium area slightly paler, clearer chestnut, eyering only on lower and rear edge of eye and bright yellow (not white), chestnut of ear-coverts extending up towards nape, feathers of forecrown greyer, upper malar and chin chestnut, upperparts purer grey, underparts paler ochrous with vague pale shaft streaks. Sexes similar. Juvenile presumably duller than adult. Race *damnata* is like nominate, but breast less streaked and less tinged ochre; *griswoldi* has richer-coloured vent. Voice. Song a fluty, sometimes quite high-noted series of phrases with lower, slightly clicky introductory notes, e.g. "chu-wu, chwi-wi-wi-wi-wiee-wiu-wu" or "ch-wu, ch-wu, chwi-wi-wi-wi-wu" and "ch-wu, chwi-wi"; also "wiu-wu-wu-wi-wi-wee-wu" (rising "wi" notes and descending last 2 notes), and even-pitched "wi, wi-wi-wi-wi" or "wu-tuu-tuu" or "ri-ri-ri-ri" interspersed with "to-we-oh to-we-oh". Has low, harsh, hoarse scolding call notes; contact call within flock a soft, complaining, descending "ah-ah-ah-ah", these notes sometimes given singly.

**Habitat.** Broadleaf evergreen forest, forest edge, disturbed and secondary forests and adjoining cultivation, low growth in old rice fields; generally at 200–2800 m, but reaching 3350 m.

**Food and Feeding.** Grasshoppers and crickets (Orthoptera), ants (Formicidae), earwigs (Dermaptera), caterpillars, moths (Lepidoptera), leafhoppers (Cicadellidae), larval bugs taken and shaken from "spittle", small black beetles (Coleoptera), muscid and non-muscid flies; also small millipedes (Diplopoda); also flowers and fruits of *Rhodamnia*, fruits of *Medinilla* and other melastomes, *Glochidion* and *Mucaranga*, *Trema cannabina*, *Embelia ribes*, *Sambucus*, petals and sepals of introduced *Passiflora edulis*. Creeps and hops within a few metres of ground, but sometimes enters canopy. Forages in parties of 4–5 or more individuals; forms mixed foraging flocks with *Garrulax palliatus* and other birds, tree-shrews (*Tupaia*) and ground-squirrels (*Dremomys*) on ground and with *Sundasciurus* squirrels in canopy. Hops up sloping boughs in manner of a woodpecker (Picidae), but not using tail for support, and picks insects off surface; clings to vertical substrates such as tree-fern trunks. Will forage on forest floor and lawns in manner of *Turdus* thrush, tail held cocked; takes grounded flying ants, and exploits road-killed or vehicle-damaged insects.

**Breeding.** Feb–Apr and Oct. Nest a loose cup of grass stems, tendrils, dead leaves and roots with no inner lining, with outer layer of leaf skeletons, fern leaves and a few feathers, placed c. 3–9 m above ground in long mass of creepers or tangle of ferns hanging from small tree. Clutch 2 eggs, bright greenish-blue or blue. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Abundant in mountains of Borneo. Common in Sabah, including in Mount Kinabalu National Park; present in Kayan Mentarang National Park, in E Kalimantan.

**Bibliography.** Banks (1937b), Davison (1992, 1997a), Finsch (1905), Gore (1968), Holmes (1997), MacKinnon & Phillips (1993), Sharpe (1889), Sheldon *et al.* (2001), Smythies & Davison (1999).

## Genus BABAX David, 1875

### 225. Chinese Babax

#### *Babax lanceolatus*

French: Babaxe lanceolé

German: Streifenbabax

Spanish: Babax Chino

Other common names. Common Babax. Streaked Hill-babbler

**Taxonomy.** *Pterorhinus lanceolatus* J. Verreaux, 1870, "les montagnes du Thibet chinois" = Muping (Paohing), south-east Xizang, China.

Geographically isolated race *woodi* recently suggested to be sufficiently distinctive to warrant species status, but characters appear to be doubtfully strong enough and vocal evidence requires further study; rigorous review required. Four subspecies recognized.

#### Subspecies and Distribution

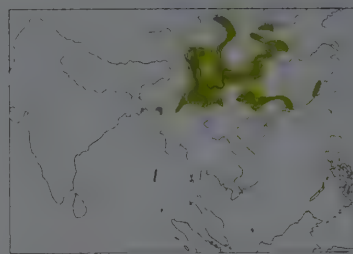
*B. l. bonvaloti* Oustalet, 1892 – S China (WC Sichuan S to SE Xizang and NW Yunnan).

*B. l. lanceolatus* (J. Verreaux, 1870) – C & S China (S Gansu, S Shaanxi and W Hubei, S to C & N Yunnan, C & E Sichuan and N Guizhou) and NE & C Myanmar.

*B. l. latouchi* Stresemann, 1929 – SE China (S Guizhou, N & C Guangxi, Guangdong, C Fujian).

*B. l. woodi* Finn, 1902 – NE India (SE Mizoram) and W Myanmar (Chin Hills).

**Descriptive notes.** 22–29 cm. 56–105 g. Relatively large, plumaged babax with bold brown and grey streaks above, creamy white with long brown flank streaks below. Nominate race has crown brown with narrow grey edgings, shading on nape, postocular supercilium area, neck side and upperparts to form line of brown streaks with vague pale buffy grey fringes, upperwing and tail dull buffy ochre, and ear-coverts buffy white, bordered below by strong brown submoustachial (rather darker than other breeds), chin to vent creamy off-white, flanks having long mid-brown streaks with darker brown centres, sometimes meeting across belly; iris white to bright orange or pale yellow; bill horn, brown or black; legs horn-grey to grey. Sexes similar. Juvenile is buffier overall than adult, with less prominent streaking (prominent only on nape, mantle and breast), plainer crown, paler ear-coverts, and brown (rather than greyish) outer fringes of wing feathers.



Race *latouchi* is smaller and darker red-brown than nominate, with blackish submoustachial stripe; *bonvaloti* is larger, and darker above; *woodi* has black submoustachial stripe, bolder pattern above, and dark shaft streaks on throat. Voice. Race *woodi* sings with loud full clear whistled "pu-i" or "tchu-wi" phrases, "pu-i, pu-i, pu-i, pu-i, pu-i, pu-i", sometimes hurried to "pu-i-pui-pui-pui...", also as a short, clear, musical, whistled "fiyüwhéé!" ("whéé" higher and louder), sometimes shortened slightly to "fiyüwhéé!" or lengthened to "fiyüwhééah". Calls with quiet chuntering "witchawitcha-witcha-wit" and single "whit" notes when on the move; also, a grouchy "jhu-wit!", and short, excited, chattering rattles, "jwitiitiiti", of variable tempo. Songs of nominate race include clear, quite jolly "wee-wer-choh, whi" or "phi-phu-chu, whi" (first 3 notes clearly spaced and descending, fourth higher or omitted); and calls are harsh thin grating buzzing sounds, and sibilant tittering "jerrt, jerrt, jerrt, chit it it it it..." etc.

**Habitat.** Open broadleaf evergreen forest, forest edge, secondary growth, thin forest and more open hillsides covered with bracken, brambles, grass etc.; scrub and grass, bamboo, sometimes tea plantations. In China occupies wide altitudinal range, 350–4265 m (lowest altitude at Tai Mo Shan, in Hong Kong); recorded only at 1200–2800 m in India and Myanmar (race *woodi*).

**Food and Feeding.** Insects and seeds. Found in pairs or family parties. Forages typically on ground or in low vegetation, occasionally ascending trees to 2–4 m; sometimes even in treetops, especially during mornings and evenings. Shy.

**Breeding.** Mar–Aug. Nest reportedly a loose but well-defined open cup, made of fir, dead bamboo and other leaves, grass stems, weed stalks and bits of fern, lined with rootlets, fine root fibres, tendrils, grass stems and moss, placed 0.6–1.2 m above ground in low thorn or other bush (including tea), brambles or sapling. Clutch 2–6 eggs (usually 3–4 in India and Myanmar, 4–5 in China), dark or deep blue to pure turquoise-blue. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Generally common in China, where recently recorded in Cenwangaoshan Nature Reserve, in Guangxi; apparently rather local in Guangdong, where only recent documented records are from Babaoshan; sparse population in Hong Kong, of captive origin. Status in Mizoram (India) uncertain; no recent published records, but reliable sight records from Phawngpui (Blue Mountain) National Park. Uncommon in Myanmar, but distinctive race *woodi* common in Natmataung National Park.

**Bibliography.** Ali & Ripley (1971), Anon. (2004c), Bangs (1921, 1932), Berlioz (1930), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Collar (2006), Deditius (1997), Dowell *et al.* (1997), Grimmer *et al.* (1998), Harington (1909, 1914a), Huang Qiang *et al.* (1993), King (1989a, 1989c), Koelz (1954), La Touche (1923, 1925–1930), Lee Kwok Shing *et al.* (2006), Lewthwaite (1996), Li Dehao (1981), Li Guiyuan *et al.* (1994), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Oustalet (1893), Rasmussen & Anderson (2005), Riley (1926), Robson (2000), Schäfer & Meyer de Schauensee (1938), Smythies (1940, 1949), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stresemann & Heinrich (1940a), Tan Yaokuang & Cheng Tsohsin (1964), Thet Zaw Naing (2003), Traylor (1967), Vaurie (1972), Venning (1912), Viney *et al.* (1994), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983).

### 226. Giant Babax

#### *Babax waddelli*

French: Babaxe de Waddell

German: Riesenbabax

Spanish: Babax Gigante

Other common names. Giant Tibetan Babax

**Taxonomy.** *Babax waddelli* Dresser, 1905, Tsangpo Valley, Xizang (Tibet), China.

Proposed race *lumsdeni*, described from Le La, on SE Xizang border with Arunachal Pradesh (NE India), is merged with nominate. Two subspecies recognized.

#### Subspecies and Distribution

*B. w. jomo* Vaurie, 1955 – Gyangze region (N of E Nepal–W Bhutan), in S Xizang (China).

*B. w. waddelli* Dresser, 1905 – Lhasa region and Lhünzhub E to R Yi'ong Zangbo and S to Lhünze (on upper R Subansiri), in SE Xizang.



**Descriptive notes.** 31–33.5 cm; 131–160 g. Nominate race has crown pale grey with narrow rufous-edged brown centres, continuing on postocular supercilium area, neck side and upperparts as long, broad brown and buffy-grey streaks, rather irregular in arrangement and almost all grey on rump; upperwing and tail dull pale brown, wing feathers with broad grey fringes on outer webs; face (lores, supercilium area, cheek and ear-coverts) streaked dirty buff-grey and brown, with slight indication of brown moustachial; chin and submoustachial area to upper breast pale greyish-buff, with dark brown shaft streaks on upper breast, shading on lower breast to belly to rufous-edged dark brown streaks on buff background, fading to plainer, dirtier buffish-grey on lower flanks, thighs and vent; iris greyish-white or silvery to brown, or black (breeding male); bill and legs blackish-brown. Differs from similar *B. lanceolatus* in much larger size, relatively longer bill and longer tail, much paler and greyer base colour above with darker streaks, duller grey-buff and streakier underparts, plain blackish-brown tail, no obvious submoustachial patch. Sexes similar. Juvenile is plainer-headed and warmer-tinted than adult, with dark iris. Race *jomo* is larger, larger-billed and somewhat paler above than nominate, with whitish-grey base colour and with streaks slightly more brownish-black. Voice. Pleasant song a rapid series of quavering whistling notes, similar to that of a *Turdus* thrush. Very loud, harsh and grating, raucous calls.

**Habitat.** Adapted to scrub habitats, in forest edge, bushy deciduous upper edges of coniferous and mixed coniferous broadleaf forests; extensive patches of alpine vegetation consisting of tall bushes and dry scrub over 1.5 m high, especially stands of willow (*Salix*) and thickets of sea-buckthorn (*Hippophae rhamnoides*), prickly oak (*Quercus*), often along watercourses and in valleys; also, more rarely, thorny scrub on rocky slopes, avoids woodland plantations. Found at 2800–4600 m.

**Food and Feeding.** Buckthorn fruit, seeds and small insects. Forages singly, in pairs or in small parties of up to eight individuals; mean group size in forest 5.5 and in scrub 5.4. Sometimes joins

mixed-species feeding flocks, which may include *Ianthocincla maxima*. Forages mainly on ground, often digging in soil, but also ascends to tops of bushes. Typically rather shy and skulking. Lives in groups of 3–8 individuals all year.

**Breeding.** Mar–Jul, sometimes later; but period short, and one brood per year assumed. Co-operative breeder in some cases, with nest attended by all group-members; others attended only by breeding pair. Nest a large, rather rough cup, exterior woven with thicker twigs and peeled bark, interior with thinner twigs and roots of plants, placed 1.8–2.1 m above ground, sometimes lower, between branches in thorn bush, willow tree or sapling; main plants used are *Rosa sericea*, *Berberis hemleyana*, *Cotoneaster divaricatus*, *Sibiraea angustata* and *Salix sclerophylla*. Clutch 2–4 eggs, usually 3 (mean 2.9), deep turquoise-blue; male known to incubate; incubation and nestling periods each 16–18 days. In one study, 75% of clutches produce at least one fledged young; egg predation by Common Magpie (*Pica pica*) recorded.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Southern Tibet EBA. Has been described variously as locally common and rare. Global population currently estimated at 120,000 individuals. Population density of 0.04 birds/ha in forest-edge habitats and of 0.03 birds/ha in bushy-scrub habitats; home ranges of two closely followed family groups were 19.9 ha and 14.8 ha, respectively. Judged presumably declining because of deforestation, although extensive pine and mixed coniferous forests with prickly oak and rhododendron still survive in regions E of Lhasa. Strong dependence on high bushes for nesting leaves species susceptible to vegetation degradation, especially through removal of scrub for firewood around middle R Yalong Zangbo (an area of rapid human development and expansion, and the species' core range). Occurs in Dongjiu Nature Reserve.

**Bibliography.** Ali & Ripley (1971), Anon. (2006d), Berlioz (1930), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Collar *et al.* (2001), Dresser (1906), Grimmett *et al.* (1998), Lu Xin (2004), Ludlow (1928, 1951), Ludlow & Kinnear (1944), Meinertzhagen (1948), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1986), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart Baker (1922), Zheng Zuoxin *et al.* (1983).

## 227. Tibetan Babax

### *Babax koslowi*

**French:** Babaxe de Koslov      **German:** Koslowbabax      **Spanish:** Babax de Koslov  
**Other common names:** Koslov's Babax

**Taxonomy.** *Kaznakowia koslowi* Bianchi, 1905. Bar Chu and Dzer Chu, tributaries of the Mekong near Chamdo, northern sector of south-east Xizang, China.

Two subspecies recognized.

**Subspecies and Distribution.**

*B. k. koslowi* (Bianchi, 1905) – SC China (SE Qinghai, E Xizang).

*B. k. yuquensis* Li Dehao & Wang Zuxiang, 1979 – southern sector of SE Xizang.



**Descriptive notes.** 27.5–30 cm; 100–125 g. Dull rufous-streaked babax, in size between *B. lanceolatus* and *B. waddelli*, with greyish throat. Nominate race has crown and upperparts rufous-brown with slightly reflective greyish feather edgings, upperwing and tail pale rufous; lores sooty grey, this colour extending vaguely to above eye; throat pale buffish-grey, underparts rufous-brown, with vague grey streaks on breast, buffish-grey streaks on belly, flanks and vent; iris pale greyish to yellowish; bill blackish; legs dark grey. Sexes similar. Juvenile presumably resembles adult. Race *yuquensis* is completely chestnut-

rufous above and rufous-chestnut below, with uppertail and undertail, and inner and outer webs of primaries, all chestnut-rufous, but feathers of chin, throat and centre of abdomen have pale edges. **VOICE.** Call (perhaps in alarm) a dry scolding rattle.

**Habitat** Juniper forest and scrub, including bush cinquefoil (*Potentilla arbuscula*) and hispid honeysuckle (*Lonicera hispida*), and mixed fir–juniper forest and scrub bordering agricultural land, at c. 3650–4500 m.

**Food and Feeding.** No information on diet. Has been observed in pairs or small parties, feeding on ground and among low vegetation. Typically rather wary. Cocks tail in manner of a thrasher (*Toxostoma*).

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Eastern Tibet EBA. Very little-known species, occurring in an inaccessible and seldom visited area, but appears to be genuinely rather scarce and localized. Some logging of forest within its range, but the species does not appear to be immediately threatened by habitat loss.

**Bibliography.** Anon. (2006d), Berlioz (1930), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Collar *et al.* (2001), Lee Tehhow *et al.* (1965), Li Dehao & Wang Zuxiang (1979b), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1986, 1993), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Zheng Zuoxin *et al.* (1983).





PLATE 17

inches 5  
cm 13



## Genus GRAMMATOPTILA

Reichenbach, 1850

### 228. Striated Laughingthrush

#### *Grammatoptila striata*

French: Garrulaxe strié German: Streifenhäherling Spanish: Charlatán Estriado

**Taxonomy.** *Garrulus* [sic] *striatus* Vigors, 1831, Naini Tal, Kumaon, Uttar Pradesh, India. Commonly placed in genus *Garrulax*. Five subspecies recognized.

#### Subspecies and Distribution.

*G. s. striata* (Vigors, 1831) – Himachal Pradesh and Uttaranchal Pradesh, in N India.  
*G. s. vibex* (Ripley, 1950) – W & EC Nepal.  
*G. s. sikkimensis* Ticehurst, 1924 – E Nepal E to EC Bhutan.  
*G. s. brahmputra* (Hachisuka, 1953) – E Bhutan, NE India (Arunachal Pradesh), and adjacent S China (SE Xizang) and N Myanmar.  
*G. s. cranbrookii* Kinnear, 1932 – N & NE Myanmar and adjacent S China (NW Yunnan).



**Descriptive notes.** 29.5–34 cm; 123–148 g. Large, bulky laughingthrush, brown with thin white streaks, bushy crest and stout bill. Nominant race has crown chestnut, with feathers long, broad and erectile in floppy crest; upperparts dull rufescent brown with bold white shaft streaks, wing fringes and tail dull rufescent brown; head side from above eye to chin and throat chestnut-chocolate with bold whitish shaft streaks, upper breast and neck side similar but paler, mid-breast to lower underparts buffy with long white streaks, dirty ochrous on lower flanks, thighs and vent; iris brownish-pink to dull brick, orbital skin

plumbeous; bill blackish-brown or dark horn, lower mandible paler; legs dull bluish-slate to greyish-brown. Sexes similar. Juvenile is warmer above than adult, streaks on underparts narrower and fainter. Race *vibex* has upperparts very slightly darker than nominate, underparts darker, shaft streaks on breast and belly narrower; *sikkimensis* is darker still, with less contrast between crown and upperparts, wing fringes and tail more chestnut, shaft streaks below narrower; *brahmputra* is duller-crowned than previous, crown less streaked and with broad blackish-brown lateral crownstripe, paler upperparts with more obvious paler dull rufous-brown to olive-brown fringing, less pronounced streaking, more contrasting breast-feather pattern, less pronounced streaking below; *cranbrookii* is like last, but with broader blackish lateral crownstripe, less obvious streaking on forehead and above eye, duller streaking on rest of head. **Voice.** Song a repeated loud, vibrant, rolling “prrit-you, prrit-pri-pri-u”, described also as “whit, whit, duwhich-whéet-whéewwhu-shitick!” (“duwhich” burry, other main notes steeply slurred), with variants including “krrrrwhit!, kwit-kwit-wheeuw!” (“krrrrwhit!” very burry and upslurred, next 2 notes upslurred, last downslurred). When agitated, emits low grumbling “aawh, aawh, aawh’o aawh, aawh...”. Calls include soft, nervous, quite high-pitched “wer-wer-wer-wer-wer”; “wuh-wuh-wuh-wuh”; “wuh-wuh-wuh-wuh-wuh-wuh”; and gentle, rising “wu-wiw”; also, an emphasized, harsh, upslurred short grumbling “gréip-gréip-gréip...”. **Habitat.** Broadleaf evergreen forest, secondary forest, scrub-jungle, thickets, bamboo and wooded patches around villages; found at 600–3060 m (mostly above c. 1000), upper limit coinciding with that of cool broadleaf forest.

**Food and Feeding.** Insects, including beetles (Coleoptera); berries and seeds, including bramble (*Rubus lineatus*), aromatic wintergreens (*Gaultheria*), *Maesa* and *Embelia*, flowers of certain vervains (*Clerodendron*) and rhododendron, and gelatinous lichen. More arboreal than most laughingthrushes, foraging mainly in middle storey to lower canopy, feeding in canopy of tall trees as well as in lower branches and undergrowth. Found singly, in pairs or in parties of 5–8 individuals, often in association with other laughingthrushes and often at fruiting trees (where up to 50 recorded together).

**Breeding.** Apr–Aug. Nest a broad, usually shallow, strongly made cup, of coarse grasses, twigs, creeper stems, rootlets, dead leaves, green moss and green fern fronds, lined with coarse roots, fine black roots and dry grasses, placed 1–6 m above ground in sapling, branches of larger tree or among climbing plants. Clutch 2–3 eggs (usually 2 in India), very pale greenish-blue or bluish-green, sometimes almost white, usually unmarked but sometimes a few very dark brownish-red specks; incubation by both sexes. No other information.

**Movements.** Resident; alleged altitudinal movements in winter near Dehra Dun (N India) require substantiation.

**Status and Conservation.** Not globally threatened. Locally common in Nepal. Abundant and widespread in Bhutan, where density of 5 territories/km of road recorded at 1600–1900 m, and present in Thrumshingla National Park. Locally common in India, where present on New Forest campus at Dehra Dun and uncommon in Dehra Dun valley (Uttaranchal), in Buxa Tiger Reserve (West Bengal), and in Eaglenest Wildlife Sanctuary and Mouling National Park (Arunachal Pradesh). Uncommon to locally common in Myanmar. In China, apparently rare in Gaoligongshan range, in Yunnan.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Birand & Pawar (2004), Cai Qikai *et al.* (1977), Cheng Tsohsin (1987), Gaston (1989), Gaston *et al.* (1994), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Islam (1993), Katti *et al.* (1992), King *et al.* (2001), Kinnear (1934), Ludlow (1951), Ludlow & Kinnear (1944), Martens & Eck (1995), Meyer de Schauensee (1984), Mohan (1997), Rasmussen & Anderson (2005), Ripley (1961), Robson (1986, 2000), Singh, A.P. (2000), Singh, P. (1995), Smythies (1940, 1949), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914, 1923), Ticehurst (1939), Zheng Zuoxin *et al.* (1983).

## Genus STACTOCICHLA Sharpe, 1883

### 229. Spot-breasted Laughingthrush

#### *Stactocichla merulina*

French: Garrulaxe à poitrine tachetée German: Fleckenhäherling Spanish: Charlatán Pechipinto  
Other common names: Spotted-breasted Laughingthrush

**Taxonomy.** *Garrulax merulinus* Blyth, 1851, Cherrapunji, Khasi Hills, Assam [= Meghalaya], India.

Genus usually merged into *Garrulax*. Until recently regarded as conspecific with *S. annamensis*. Proposed race *toxostomina* (from Manipur, in NE India) considered inseparable from nominate. Three subspecies recognized.

#### Subspecies and Distribution.

*S. m. merulina* (Blyth, 1851) – NE India (SE Arunachal Pradesh S to Meghalaya, Mizoram and Manipur), W & N Myanmar and S China (W Yunnan).  
*S. m. laoensis* (Meyer de Schauensee, 1938) – NW Thailand.  
*S. m. obscura* (Delacour & Jabouille, 1930) – SE Yunnan (China), N Laos and N Vietnam (N Tonkin).



**Descriptive notes.** 25–26 cm. Medium-sized brown laughingthrush with pronounced blackish-brown spots on buffish-white throat and breast. Nominant race has crown and upperparts, including head side (lower submoustachial area, cheek, ear-coverts), neck side, upwiring and tail, rich olive-toned brown, narrow buff postocular streak; lores and upper submoustachial stripe dark brown, malar line of dark brown streaks; chin to breast buff with broad dark brown streaks (tending to align as longer stripes), buff continuing to lower belly but shading to plain brown with slight ochre tinge on flanks, vent rusty; iris pale yellowish to pale reddish-brown, orbital skin pale leaden-grey; bill dark horn-brown, greyish on lower mandible; legs pale brown to dark brown. Sexes similar. Juvenile is more rufous above and on flanks, wings and tail than adult, iris brown. Race *laoensis* is like nominate, but streaks on underparts blacker and more separate, buff ground colour paler; *obscura* is slightly darker above and on face, richer buff below, with heavier, blacker spotting on breast. **Voice.** Song loud, rich and melodious, a remarkable, prolonged, rambling series of rich musical phrases, with much mimicry; recalls that of *Dryonastes chinensis* but much richer and more varied, lacking harsh notes and squeaky whistles. Many phrases consist of clear, human-like whistles in slightly off-key melody.

**Habitat.** Understorey shrubbery and edge of broadleaf evergreen forest, bamboo, densely overgrown abandoned cultivation, dense secondary growth and scrub; at 800–2000 m.

**Food and Feeding.** No information on diet. Found singly, in pairs or in family groups. Forages on or near ground; unobtrusive, shy and very skulking.

**Breeding.** Apr–Jul. Nest described as a fairly strong and compact, rather shallow cup, made of moss, roots, grass, leaves and fern fronds, lined with rootlets of ferns, moss and other plants, occasionally fine creeper stems, fine twigs and tendrils, placed low down (often only slightly above ground) in undergrowth of ferns or brambles (*Rubus*), in thick shrub or deep inside bamboo clump. Clutch 2–3 eggs, generally 2, pale blue to green-tinged blue; incubation by both sexes. No other information.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Rather uncommon to scarce. Generally uncommon in India, but locally not uncommon in Assam; rare in Namdapha National Park, in Arunachal Pradesh. Rare in marginal range in China. Generally scarce to uncommon in SE Asian range. Rare in Fan Si Pan National Park and present in Pu Mat Nature Reserve, in Vietnam.

**Bibliography.** Ali & Ripley (1972), Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Choudhury (2000), Collar (2006), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1930, 1931a), Eames (1995), Eames *et al.* (2001), Godwin-Austen (1874), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Hume (1888), King *et al.* (2001), Koelz (1954), Lekagul & Round (1991), Mayr (1938), Meyer de Schauensee (1984), Rasmussen & Anderson (2005), Robson (2000), Showler, Davidson, Khounme Saliwong & Khamkhoun Khounhohline (1998), Singh (1995), Smythies (1986), Stanford & Ticehurst (1935), Thevlis *et al.* (1998), Vogel *et al.* (2003).

### 230. Orange-breasted Laughingthrush

#### *Stactocichla annamensis*

French: Garrulaxe du Langbian German: Orangebrusthäherling Spanish: Charlatán Pechinaranja

**Taxonomy.** *Stactocichla merulina annamensis* Robinson and Kloss, 1919, Dran [11°49' N, 108°38' E], Annam, Vietnam.

Genus usually merged into *Garrulax*. Until recently regarded as conspecific with *S. merulina*. Monotypic.

#### Distribution. S Annam, in S Vietnam.

**Descriptive notes.** 24–25 cm. Medium-sized laughingthrush with brown upperparts and flanks, blackish throat, orange-rufous supercilium and underparts with neatly black-streaked breast. Has crown to scapulars and rump, including ear-coverts and neck side, rich olive-toned brown, uppertail-coverts a shade paler, upwiring and tail a shade darker (but light-dependent); bristly lores and forehead black, this colour extending just above and below eye and contiguous with blackish

On following pages: 231. Chinese Hwamei (*Leucodioptron canorum*); 232. Taiwan Hwamei (*Leucodioptron taewanum*); 233. Kerala Laughingthrush (*Strophocincla fairbanki*); 234. Black-chinned Laughingthrush (*Strophocincla caehimans*); 235. Bhutan Laughingthrush (*Strophocincla imbricata*); 236. Streaked Laughingthrush (*Strophocincla lineata*); 237. Striped Laughingthrush (*Strophocincla virgata*); 238. White-browed Laughingthrush (*Pterorhinus sannyio*); 239. Plain Laughingthrush (*Pterorhinus davidi*); 240. Snowy-cheeked Laughingthrush (*Ianthocincla sukatschewi*); 241. Moustached Laughingthrush (*Ianthocincla cineracea*); 242. Rufous-chinned Laughingthrush (*Ianthocincla rufogularis*); 243. Chestnut-eared Laughingthrush (*Ianthocincla konkakinhensis*); 244. Barred Laughingthrush (*Ianthocincla lunulata*); 245. White-speckled Laughingthrush (*Ianthocincla bieti*); 246. Giant Laughingthrush (*Ianthocincla maxima*); 247. Spotted Laughingthrush (*Ianthocincla ocellata*).





submoustachial area, chin and throat; pale orange-rufous area on forehead (immediately above black) and extending as postocular supercilium; breast orange-rufous with neat black streaks (narrower and clearer than in *S. merulina*), mid-belly plain orange-rufous, becoming paler on vent, with flanks and thighs rufous-brown; iris brown, orbital skin black; upper mandible blackish, lower mandible dark grey; legs dark brown to bluish-grey. Sexes similar. Juvenile apparently undescribed. Voice. Song loud, rich and melodious, of rich musical phrases in prolonged rambling series, with much mimicry; very like that of *S. merulina*.

**Habitat.** Undergrowth and edge of broadleaf evergreen forest, bamboo clumps, densely overgrown abandoned cultivation, treefall light-gaps in closed-canopy evergreen forest, dense secondary growth and scrub; at 915–1510 m.

**Food and Feeding.** No information on diet. Forages singly, in pairs or in family groups, on or near ground, unobtrusive, shy and very skulking.

**Breeding.** Three specimens with regressing gonads in Mar. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Uncommon to locally common within very small range. Present in Thuong Da Nhim and Chu Yang Sin Nature Reserves.

**Bibliography.** Berlioz (1930), Collar (2006), David-Beaulieu (1944), Delacour & Jabouille (1927, 1930, 1931a), Farnes (1995), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993b).

## Genus *LEUCODIOPTRON* Bonaparte, 1854

### 231. Chinese Hwamei

#### *Leucodioptron canorum*

**French:** Garrulaxe hoamy **German:** China-Augenbrauenhäherling **Spanish:** Charlatán Canoro  
**Other common names:** Melodious Laughingthrush, Chinese Thrush, Spectacled Jay-thrush

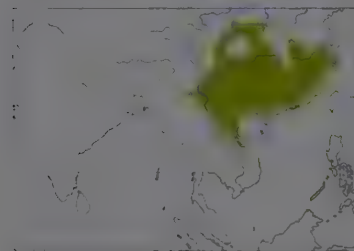
**Taxonomy.** [*Turdus*] *Canorus* Linnaeus, 1758, Amoy, Fujian, China.

Genus previously subsumed into *Garrulax*. Formerly treated as conspecific with *L. taewanum*, but differs significantly in plumage, morphometrics and genetics, and to some degree in voice. Two subspecies recognized.

**Subspecies and Distribution.**

*L. c. canorum* (Linnaeus, 1758) – SE China from S Gansu, S Shaanxi, Hubei, SE Henan and S Jiangsu to Yunnan (except NW), Guangxi and Guangdong, also E Laos and Vietnam (S to NC Annam).

*L. c. owstoni* (Rothschild, 1903) – Hainan I.



**Descriptive notes.** 21–24 cm: 49–75 g. Relatively plain medium-sized laughingthrush, warm brown with darker streaking on head and breast, and with bold white eyering and postocular stripe. Crown is warm ochre-tinged brown with vague darker brown streaks, upperparts similar but streaking very diffuse, fringes of wing feathers warm ochre-tinged brown, tail darkish brown; bold white eyering and postocular streak, ear-coverts plain dull ochreous-brown; lores, cheek, neck side and chin to upper breast warm brownish-ochre with narrow dark brown streaks, lower breast, flanks, thighs and vent warm brownish-ochre, mid-belly dull grey; iris brown to pale greenish-yellow; bill dusky yellow; legs dusky yellowish to dark flesh. Sexes similar. Juvenile has less streaking on head and breast than adult. Races very similar: *owstoni* is marginally more olive above and on ear-coverts than nominate. Voice. Song by male rich, varied, quite high-pitched, including regular repetition and some mimicry; usually starts slowly, then increases in volume and pitch (may repeat this during single outburst); faster and higher-pitched than song of *Dryonastes chinensis*, reminiscent of that of *Pellorneum albiventre*. Female has series of monotonous calls which, given in earshot of male, prompt song from him.

**Habitat.** Shrublands, open woodland, thickets, scrub, bamboo, reeds, tall grass, gardens, vacant lots in urban areas; up to 1800 m in China, to 1450 m in SE Asia.

**Food and Feeding.** Mainly insects, including locust eggs (Locustidae) and ants (Formicidae); also fruit, seeds and sometimes cultivated maize (*Zea*) and other grain. In Hong Kong study, in Aug–May, 86% of 72 faecal samples contained insects and 81% contained fruit (of 14 plant taxa, with a further two seen being eaten). Found singly, in pairs or in small parties. Searches for food on ground.

**Breeding.** Mar–Aug; multi-brooded. Nest is reported to be a large cup, outwardly rough but with well-defined walls, made of leaves (including oak and bamboo), grasses, stems, ferns, creepers, roots and tendrils, lined with tendrils, rootlets, grass, leaves, thin twigs, pieces of vine and moss, placed in grass, bush (including holly and tea), small tree or on tree stump, from ground to 2 m up. Clutch 2–5 eggs, usually 3–4, pale blue to deep bluish-green, reportedly occasionally with large white spots; incubation mainly by female, period 12 days; no information available on fledging period.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. CITES II. Relatively common in Chinese range. In recent fieldwork in S China found at 36 sites (67% of those visited), including Shiwandashan National Nature Reserve (Guangxi), where rare, common and widespread in Hong Kong, where population has recovered strongly with reduction in trapping, and possibly with spread of shrublands. Commonly fairly common in SE Asian range. Few records from Laos, but possibly largely under-recorded owing to low interest in scrub habitat. Under very heavy trapping pressure in Vietnam, where present in Ba Be National Park and Na Hang Nature Reserve, and in five protected areas in the Annamese Lowlands (BA). Local population also in Singapore (uncommon), established outside natural range also in Taiwan and Japan (three main centres of population).

**Bibliography.** Andersson (2001), Anon. (2004d), Bangs & Peters (1928), Berlioz (1930), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960, 1962), Cheng Tsohsin *et al.* (1963), Collar (2006), Corlett (1998), Cox *et al.* (1992), David-Beaulieu (1944, 1950), Davidson (1998), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Duckworth *et al.* (2002), Eames *et al.* (2001), Fang Woeihong (2005), Fischer (1995), Herklots (1974), Hill (2000), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Kawakami & Yamaguchi (2004), King (1987), King & Liao Weiping (1989), King & Zheng Guangmei (1988), Kinnear (1929), Koh Chaonien & Lee Peifen (2003), La Touche (1899, 1906, 1923, 1925–1930), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao, Luo Jiaye *et al.* (1994), Li Guiyuan, Zhang Qingmao & Wen Anxiang (1993), Li Shoushien *et al.* (2006), Liu Kezhi *et al.* (1994), McCarthy (2006), Meyer de Schauensee (1984), Nguyễn Đức Tu *et al.* (2001), Robbins *et al.* (2006), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Round (1999), Sato (2000), Schleussner (1983), Stresemann (1923c), Traylor (1967), Tu Hsiao-wei (2003), Tu Hsiao-wei & Severinghaus (2004), Wu Zhikang *et al.* (1986), Yeo (1969), Yu Zhiwei *et al.* (1986), Zhang Keyin *et al.* (2003), Zhang Quntan *et al.* (1994), Zhao Xiubi (1994), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983), Zhu Xi & Fan Houde (1995).

### 232. Taiwan Hwamei

#### *Leucodioptron taewanum*

**French:** Garrulaxe de Taiwan

**German:** Taiwan-Augenbrauenhäherling

**Spanish:** Charlatán de Formosa

**Taxonomy.** *Garrulax taewanus* Swinhoe, 1859, Taiwan.

Genus previously subsumed into *Garrulax*. Formerly treated as conspecific with *L. canorum*, but differs significantly in plumage, morphometrics and genetics, and to some degree in voice. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 21–24 cm. Crown is cold ochre-tinged buff with dark brown streaks, shading on mantle to buffish-grey with soft-edged irregular streaking; rest of upperparts greyish-tinged mid-brown, upperwing warmer ochre-tinged brown, tail darkish brown with vague darker barring; lores, cheek and ear-coverts buffy brown with slight dappled effect; chin to upper breast dull ochreous-buff with narrow dark brown streaks, shading on lower breast, flanks, thighs and vent to plain greyish-buff and on belly to vague pale grey; iris greyish, orbital skin yellowish; bill and legs yellowish. Differs from very similar *L.*

*canorum* in having narrower eyering, no postocular streak, coloration above greyer with broader, darker streaking, below pale dirty buff with duller flanks and vent, tail slightly longer. Sexes similar. Juvenile has less streaking on head and breast than adult. Voice. Songs rich and varied, quite high-pitched, resemble those of *L. canorum* but less complex, containing significantly fewer syllable types, fewer syllable changes, smaller syntax combinations and more syllable repeats per song.

**Habitat.** Secondary vegetation, upper undergrowth and lower tree strata in foothill and submontane *Ficus–Machilus* and *Machilus–Castanopsis* zones, to 1200 m.

**Food and Feeding.** Insects and seeds found in stomachs. Forages singly, in pairs or in small parties, on ground.

**Breeding.** Mar–Aug. Nest a rough cup of leaves (including *Miscanthus* and bamboo), twigs, roots and coarse grasses, rather loosely bound together with tendrils and sometimes with lining of pine needles, placed up to 2 m above ground in bush (including *Acacia* and *Miscanthus*). Clutch 2–3 eggs, turquoise to greenish-blue; incubation mainly by female, period 12 days; no information on fledging period.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Fairly common to common. Formerly abundant, but has suffered from extensive habitat clearance in lower parts of elevational zone, coupled with considerable hunting and trapping pressure. Categorized as “Endangered” in a national red list. Now threatened by interbreeding with *L. canorum*; latter being imported in high volume into Taiwan for its singing abilities, and individuals, once discovered to be female, are usually released, thereby becoming available to breed with males of present species.

**Bibliography.** Berlioz (1930), Cheng Tsohsin (1987), Collar (2006), Fang Woeihong (2005), Hachisuka & Udagawa (1950, 1951), Li Shoushien *et al.* (2006), McCarthy (2006), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Smith & Yu Honsen (1992), Tu Hsiao-wei (2003), Yen Chungwei (1990).

## Genus *STROPHOCINCLA* Wolters, 1980

### 233. Kerala Laughingthrush

#### *Strophocincla fairbanki*

**French:** Garrulaxe de Fairbank **German:** Graubrusthäherling **Spanish:** Charlatán de Kerala

**Other common names:** Grey-breasted Laughingthrush (when combined in a species with race *jerdoni* of *S. cachinnans*)

**Taxonomy.** *Trochalopteron Fairbanki* Blanford, 1869, Palni Hills, southern India.

Genus usually subsumed in *Garrulax*. Species sometimes placed in genus *Trochalopteron*. Has until recently often been combined in a species with race *jerdoni* of *S. cachinnans*; further study required. Two subspecies currently recognized.

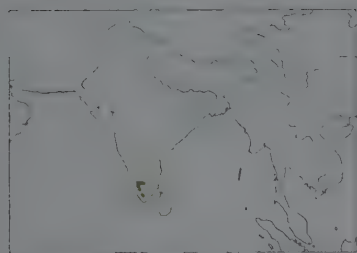
**Subspecies and Distribution.**

*S. f. fairbanki* (Blanford, 1869) – SE Kerala and SW Tamil Nadu (N of c. 9° N), in SW India.

*S. f. meridionalis* (Blanford, 1880) – S Kerala and S Tamil Nadu (S of c. 9° N).

**Descriptive notes.** 20.5 cm. Small laughingthrush, dull olive-brown above with white supercilium, grey-streaked whitish breast and rufous-chestnut lower underparts. Nominative race has crown dark brown, upperparts shading from brown-tinged dark olive on nape to ochre-tinged dark olive on rump, with upperwing and tail olive-brown; white supercilium, pale greyish-brown lores and





of nominate race consists of short, mellow, clear, slurred notes, starting with 1–2 steeply ascending, hesitant questioning “quweét” notes, joined in duet by slightly descending series of more abrupt notes “kweer-kweer (kweer, kweer)”; also a more complex “kleer-eeet”, perhaps duetted, the first note strongly downslurred, the second level. Calls include irregularly uttered, very short, subdued, dry, musical, nervous “ptr’tr’tr” or slightly longer “ptr’tr’tr’tr’tr”. Vocalizations of race *meridionalis* apparently unrecorded.

**Habitat.** Thickets lining streams through tea and cardamom plantations, scrub and secondary forest, occasionally gardens, edges of broadleaf evergreen forest, range apparently coinciding with occurrence of wild raspberry (*Rubus*); recorded at 800–2135 m.

**Food and Feeding.** Insects, berries and fruit, including brambles (*Rubus*), *Maesa*, *Luvunga*, and *Trema*. Forages in parties of 6–14 individuals, sometimes up to 30, and may join bird waves. Forages in undergrowth and low bushes, occasionally descending to ground to search among leaf litter.

**Breeding.** Dec–Jun. Nest, built by both sexes, a cup made of coarse grasses, moss and bracken leaves, lined with fine grasses, placed up to 3 m above ground in bush or among tall bracken. Clutch 2 eggs, pale greenish-blue to pale blue, rather thinly marked with spots, small blotches, lines and scrawls of brownish and reddish-purple to bright claret (very similar/identical to those of *S. cassiniana*); incubation by both sexes, nestlings fed by both sexes; no information on duration of incubation and nestling periods.

**Movements.** Resident.

**Status and Conservation.** Not assessed. At best, Near-threatened, as hitherto considered, but re-evaluation required, in light of removal of race *jerdoni* to *S. cassiniana*. Restricted-range species: present in Western Ghats EBA. Although this species’ range is small, its tolerance for disturbed habitats suggests that it is not immediately threatened by habitat modification. Increasing human population, however, has led to increased illegal encroachment into Western Ghat forests, livestock grazing and the harvesting of fuelwood and huge quantities of forest products, such as bamboo and canes. Furthermore, hydropower development and road-building are causing reductions in forest cover in some areas.

**Bibliography.** Ali & Ripley (1972), Bates (1931, 1935), Berlioz (1930), Collar *et al.* (2001), Grimmett *et al.* (1998), Hume & Oates (1889), Rasmussen & Anderton (2005), Stattersfield *et al.* (1998), Stuart Baker (1922).

## 234. Black-chinned Laughingthrush

### *Strophocincla cassiniana*

**French:** Garrulaxe des Nilgiri **German:** Zimtbrusthäherling **Spanish:** Charlatán de los Nilgiris  
**Other common names:** Rufous-breasted Laughingthrush, Nilgiri Laughingthrush (*cassiniana*); Grey-breasted/White-breasted/Jerdon’s Laughingthrush (*jerdoni*)

**Taxonomy.** [*Crateropus*]. *cassiniana* [sic] Jerdon, 1839, Nilgiri Hills, India.

Genus usually subsumed in *Garrulax*. Species sometimes placed in genus *Trochalopteron*. Race *jerdoni* has until recently often been combined in a separate species with *S. fairbanki*; further study required. Two subspecies recognized.

**Subspecies and Distribution.**

*S. c. jerdoni* (Blyth, 1851) – SW Karnataka (Brahmagiri Hills, Banasore Peak) and NE Kerala (Coorg, Wynad), in SW India.

*S. c. cassiniana* (Jerdon, 1839) – Nilgiri Hills (W Tamil Nadu and adjacent NE Kerala).



**Descriptive notes.** 20–5 cm. Small laughingthrush, dull bronzy brown above, dull rufous below, with blackish face and throat and bold white supercilium. Nominative race has crown dark brownish-grey with slight bronzy sheen, shading paler to slightly bronzy grey-brown on neck side and upperparts, less grey lower down, upperwing and tail ochrous-brown; white supercilium, dull rufous ear-coverts; blackish lores, short postocular eyestripe, chin and upper throat, shifting abruptly (but not clear-cut) to rich rufous lower throat to belly, with rich ochrous-brown flanks, thighs and vent; iris crimson or reddish-brown; bill dull

black or horn-brown; legs plumbeous brown. Sexes similar. Juvenile apparently undescribed. Race *jerdoni* differs from nominate in greyer-shaded crown, greyer mantle and back; silvery-grey ear-coverts shading to whitish-grey neck side, lower throat and breast, breast with indistinct greyish (sometimes rufous-tan) streaking. **Voice.** Songs of several types: one a long, rising, crescendoing series of short, worried-sounding, nasal “aingk” notes, perhaps falling away after several seconds, then rising again and ending suddenly; another a comical-sounding, rather cackling, rising, very nasal “onk-ur-whur-whéenk” (first notes hoarse, last 2 whistled and successively longer and stressed), followed by low hoarse laughing “urg-urg-urg...”; third a curious, halting, very nasal “whur-wháink, whur-wháink”, which may be followed by rising, rapid sequence of very nasal “aingk” notes. Song also said to be a rather nasal “u wi-yu, wi-yu wi”, accompanied antiphonally (perhaps from females) by low “dhu-dhu-dhu”. Calls include irregularly repeated, short, gravelly, nasal, staccato, grunting “grnk” or “grmnk”, a more rattled version, and rapid nasal, hard, chattering “chink-chink-chink...”. Also, harsh “jho” notes mixed with high-pitched “pititit” notes.

**Habitat.** Broadleaf evergreen and semi-evergreen forest, especially “shola” forest (formations in ravines or upland depressions) with dense undergrowth and fringes; also forest edge, wooded gardens, patches of thick scrub (including *Lantana camara*, and “hill guava” *Rhodomyrtus tomentosa*); only occasionally to rarely in eucalypts (*Eucalyptus*), acacia (*Acacia*) and tea plantations. At 1220–2285 m.

**Food and Feeding.** Invertebrates; also nectar, flowers, fruits and berries, including those of brambles (*Rubus*) and *Rhodomyrtus tomentosa* and introduced Peruvian cherry or cape gooseberry (*Physalis peruviana*). Forages on ground and among low vegetation, in pairs or in flocks of twelve or more individuals, sometimes in association with other species in bird waves.

**Breeding.** Jan–Jul. Nest a bulky but compact, sometimes externally untidy, usually deep cup, made of roots, dead leaves, leaf skeletons, small twigs, coarse grasses, moss, lichen, withered fibrous coverings of *Physalis peruviana* and cobwebs, lined with fine grasses, plant fibres, moss roots, fur, feathers and “cotton-wool”, placed on ground or up to 4 m above ground in bush or small tree, often in relatively open area of forest edge; in one study of 39 nests, 28 were in indigenous and nine in exotic plants, most being built near stream, road or cattle trail, and most in outer branches of tree. Clutch 2–3 eggs, pale blue to greenish-blue, with blotches, streaks and specks of pale reddish-brown, ash, purplish-brown or blackish-brown; incubation and nestling periods each 16 days. Commonly parasitized by Jacobin Cuckoo (*Clamator jacobinus*), which lays up to two eggs per nest. Rates of nest predation fairly high; in one study of 39 nests, 72 eggs laid, 52 hatched and 40 nestlings successfully fledged, giving success of 57%; success 60% in another study.

**Movements.** Resident.

**Status and Conservation.** ENDANGERED (nominative race only; taxonomic rearrangement, with *jerdoni* now included in present species, necessitates new assessment, which would probably reduce threat status to Vulnerable). Restricted-range species: present in Western Ghats EBA. Population of nominate race estimated at 2500–9999 individuals and decreasing, within geographical range of 1620 km<sup>2</sup>; generally common or abundant within this range at start of 20th century, and recent observations indicate it to be only locally common. Large-scale conversion of habitat to plantations, reservoirs and crops and human settlement pose main threats. Commercial plantations of tea, eucalypts and acacias have been increasing in size across range. Between 1961 and 1988, 47% of evergreen/semi-evergreen forest was lost in Kerala portion of Western Ghats, with increases in plantation and deciduous forest cover of 6% and 7.5%, respectively. Nominative race occurs in Mukurti National Park, in Tamil Nadu, and small part of range encompassed by upper reaches of Silent Valley National Park, in Kerala. Some sholas in Nilgiri Hills afforded partial protection as reserve forests and included in Nilgiri Biosphere Reserve, but these receive considerably less protection than do national parks. Race *jerdoni* fairly common locally.

**Bibliography.** Ali & Ripley (1972), Anon. (2006d), Bates (1931), Berlioz (1930), Betham (1902), Butchart & Stattersfield (2004), Collar *et al.* (2001), Davison (1883), Grimmett *et al.* (1998), Hume & Oates (1889), Islam (1987, 1989, 1990, 1994, 1995), Khan (1978), Rane (1982), Rasmussen & Anderton (2005), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart Baker (1922), Zacharias & Gaston (1993).

## 235. Bhutan Laughingthrush

### *Strophocincla imbricata*

**French:** Garrulaxe du Bhoutan

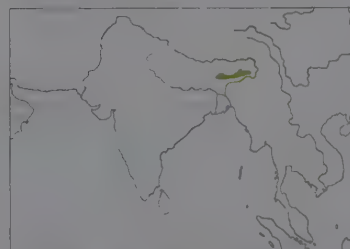
**German:** Braunnäherling

**Spanish:** Charlatán de Bután

**Taxonomy.** *Garrulax*]. *imbricata* Blyth, 1843, Bhutan.

Genus usually subsumed in *Garrulax*. Species sometimes placed in genus *Trochalopteron*. Until recently considered conspecific with *S. lineata*, but distinct in many features, with no intergradation despite close geographical proximity; also, most vocalizations differ considerably, and playback of recordings has apparently elicited no response. Monotypic.

**Distribution.** Bhutan, NE India (W Arunachal Pradesh) and adjacent S China (S & SE Xizang).



**Descriptive notes.** 19–20 cm; 40–55 g. Small laughingthrush, streaky warm brown with grey ear-coverts. Has crown to mantle and back warm mid-brown with long glossy shafts, these becoming white on back but all fading to plain dirty greyish-brown on rump and uppertail-coverts; wing fringes warm mid-brown, fringes pale grey on outermost primaries and pale olive on adjacent ones, tail dull rufescent brown with narrow dull buffy-white tips; face (lores, submoustachial area, cheek, ear-coverts and superciliary area) and neck side pale greyish-brown with narrow white shaft streaks; chin to belly slightly pinkish-tinged greyish-brown

with whitish shafts, shading to plainer, darker, dirtier rufous-brown on flanks, thighs and vent; iris bright reddish-brown to brown; upper mandible dark horn, lower mandible pale horn; legs horn-brown to brownish-black. Distinguished from very similar *S. lineata* by unstreaked rich brown crown, lack of rusty ear-coverts, more extensive white shaft streaks from moustachial region and ear-coverts to side of neck, richer brown upperparts and tail, absence of rufous wingpanel and of background grey in plumage above or below (making for a richer, darker lower belly), considerably longer tail with greatly reduced pale tips. Sexes similar. Juvenile apparently undescribed. **Voice.** Songs recall those of *S. lineata* but shorter, with introductory notes greatly reduced and jumbled (probably often inaudible): “(fz)-ééyééw” (main strophe strongly downslurred), “(fwer)fwééyééw” (almost inaudible introductory notes, then quickly upslurred and downslurred thin whistle), and “(fst)-kléééééé” (prolonged end note); also a quick, uninitiated 3-note “kip-ká-wéér”, which may be duetted with chittery-prefaced songs more like those of *S. lineata*, or similar version prefaced by buzzy, excited, squealing “schléé”. First song type sometimes duetted with more slurred “tuuwhéééééé”. Songs may also be mixed with buzzy chittering and trills in continuous sequence or burry triplets (which are also sometimes given alone), which have each note descending (but all on same pitch), the first the longest but the other two louder. Calls include short, buzzy, excited upturned “bzrrt-bzrrt...”, irregularly repeated.

**Habitat.** Bushes and long grass, thick scrub bordering cultivation, scrub and thickets in open and secondary forest, including in areas opened up by tree-felling; found at 1400–2400 m, but occasionally down to 900 m and up to 2900 m, and one record in W Bhutan at 3800 m.

**Food and Feeding.** No information on diet; presumably small invertebrates and some vegetable matter. Occurs in pairs or in small flocks of up to six individuals, and of 10–20 or more birds during winter. Forages primarily on ground, generally rather confiding.

**Breeding.** Apr–Jun. Nest-building pair in Bhutan (in Apr), disappearing into bracken thicket. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common in Bhutan: near Zhemgang, density of 0.8 breeding pairs/km of road at 1600–1900 m (probably in suboptimal habitat). Present in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh), in India.

**Bibliography.** Ali *et al.* (1996), Chatterjee & Saxena (1996), Collar *et al.* (1998), Grimmett *et al.* (1998), Jullien & Kinnear (1937, 1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Singh (1995), Spierenburg (2005), Vaurie (1954b), Zheng Zuoxin *et al.* (1983).



## 236. Streaked Laughingthrush

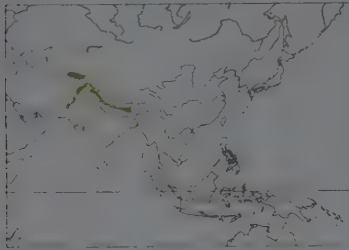
### *Strophocincla lineata*

**French:** Garrulaxe barré **German:** Borstenhäherling **Spanish:** Charlatán Barrado  
**Other common names:** Himalayan Laughingthrush

**Taxonomy.** *Cinclosoma lineatum* Vigors, 1831, Simla–Almora district, north-west Himalayas, India. Genus usually subsumed in *Garrulax*. Species sometimes placed in genus *Trochalopteron*. Until recently considered conspecific with *S. imbricata*, but distinct in many features, with no intergradation despite close geographical proximity; also, most vocalizations differ considerably. Five subspecies recognized.

#### Subspecies and Distribution.

*S. l. schachdarensis* Stepanyan, 1998 – SE Uzbekistan E to SE Tajikistan.  
*S. l. bilkevitchi* (Zarudny, 1910) – SW Tajikistan and adjacent SE Uzbekistan, NE & SE Afghanistan and W Pakistan.  
*S. l. gilgit* (E. J. O. Hartert, 1909) – N Pakistan (Chitral E to Hunza, Skardu and Astor, N of Burzil Pass) and adjacent N part of E Afghanistan.  
*S. l. lineata* (Vigors, 1831) – NE Pakistan (S of R Indus) E to N India (Uttaranchal Pradesh).  
*S. l. setafer* (Hodgson, 1836) – Nepal E to Sikkim and N West Bengal (India), and adjacent S China (S Xizang).



**Descriptive notes.** 18–20 cm; 35–46 g. Small laughingthrush, streaky-brown and grey with dull rufous ear-coverts. Nominant race has crown, neck side and mantle streaked dull rufous-brown and grey (grey dominant), shifting on scapulars and back to dull rufous-brown with sparse long whitish shaft streaks, rump dull pale olive-grey; upperwing and tail rufescent pale grey-brown, former with strong rufescent wingpanel, latter with dark-bordered dirty greyish tips; ear-coverts dull rufous, face (lores, supercilium, cheek and submoustachial area) streaked dull rufous and grey (grey subordinate); chin to lower underparts similar with

narrow buff shaft streaks, flanks, thighs and vent dark ochraceous olive-brown; iris reddish-brown to brown; bill dark brown, paler below; legs flesh-brown or pale horn-brown. Sexes similar. Juvenile is somewhat warmer and less distinctly streaked than adult, crown showing vague dark striations, mantle and breast with thin pale shaft streaks. Race *setafer* is like nominate but centres of streaks on crown and mantle blacker, posterior upperparts darker olive, base colour of underparts warmer and browner, and broader blackish subterminal tailband; *bilkevitchi* is much paler and greyer above than nominate, grey rump and uppertail-coverts, grey (rather than grey-brown) belly, paler, buffier underpart markings, paler rusty ear-coverts; *gilgit* is similar to previous but somewhat colder, darker grey; *schachdarensis* is palest. Voice. Apparent songs of 2–3 types. First (perhaps from male) a very thin, high-pitched whistle followed by clear note, “siiii-chu...siiii-chu...” or “siiii-siiii-chu”; second (perhaps from female) a fast, liquid, tinkling trill ending with clear note, “trrrrititit-chu”, also described as loud chattering notes immediately followed by clear, thin, elastic whistle (falling steeply and ending at low pitch), e.g. “chichichichi-chéwéw”, or similar with additional air, rising and then falling note (e.g. “chittitititichééter-whéééé!”), chittery notes fairly evenly spaced, and often ascending and crescendoing. Both types of song may be given on own or antiphonally, and are repeated every few seconds. Often given in duet with song is a loud, steeply falling, sibilant “pseeuu, pseeu-pseeu” (last note shortest, clearest); variants may be mixed with single higher, shorter falling note followed by 3 short, thin, wheezy, progressively shorter notes on same pitch, e.g. “seer-pseep-seep-sip”. Third song type short, syncopated, apparently different from first type above, comprises mostly dry, burry trills, e.g. “(ka-)krrrcheequerrrrr” (last note prolonged, strongly descending and diminishing), often in duet with loud, steeply falling, sibilant “pseeuu, pseeu-pseeu”, last note shortest and clearest. Calls include low, harsh grumbling, mixed with short high-pitched notes; very high-pitched, buzzy short notes continuously in alarm, “tsip, tsip, tsip, tsip...”.

**Habitat.** Bushes and scrub, including brambles (*Rubus*), the witch-hazel *Parrotiopsis jaquemontiana* (Hamamelidaceae), Lindley’s spiraea (*Spiraea lindleyana*), hopseed bush (*Dodonaea viscosa*) and dwarf willow (*Salix*), on hill slopes and ravine slopes; also barberry (*Berberis*) and rose (*Rosa*) shrubbery, scrub and bushes in open forest, at forest edge, and around human habitation, field borders, gardens, thick scrub and stone walls near cultivation; also juniper forest and chilgoza pine (*Pinus gerardiana*) scrub-forest in Baluchistan (Pakistan). Found at 1400–3905 m (mostly 1800–3000 m), some descending as low as 600 m during harsh winter weather.

**Food and Feeding.** Insects, including moths and caterpillars (Lepidoptera), small flies (Diptera), and ants (Formicidae); also spiders (Araneae), and berries, fruits and seeds; occasionally breadcrumbs. Found in pairs or in small parties of 3–6 individuals, depending on season. Keeps to ground. A “garden bird” in W Himalayan towns and villages, feeding in open, as well as under bushes.

**Breeding.** Mar–Oct; multi-brooded. Nest reportedly an outwardly loose, untidy, thick-walled, deep cup (sometimes rather massive), made of coarse dry grasses, fine plant stems, dead leaves, fibrous plant bark, creepers, dry twigs, ferns and moss, lined with fine grass roots, fine grasses, rootlets, pine needles and hair, placed in thick bush, on low tree branch, in pollard tree, thick grass or on bank among overhanging grass, rarely in honeysuckle on house verandah, from ground level to 2–4 m up. Clutch 2–4 eggs, usually 3, pale greenish-blue to pure pale blue; incubation by both sexes; no information on duration of incubation and nestling periods. Nests apparently often parasitized by Jacobin Cuckoo (*Clamator jacobinus*), Large Hawk-cuckoo (*Cuculus sparveriioides*) and Indian Cuckoo (*Cuculus microgaster*).

**Movements.** Resident; some minor altitudinal movements associated with hard winter weather.  
**Status and Conservation.** Not globally threatened. Generally the commonest and most conspicuous laughingthrush in W Himalayas. Widespread and common in Pakistan, including in Palas Valley, in North-West Frontier Province. Locally common in Shey-Phoksundo National Park, in Nepal. In India, common in Nanda Devi Biosphere Reserve (Uttaranchal), common (mainly in terraced fields) in Mahatma Harsang Wildlife Sanctuary (Himachal Pradesh), and present in Buxa Tiger Reserve (West Bengal). Common in small range in China.

**Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Bates & Lovther (1952), Berlioz (1930), Cheng Tsohsin (1987), Choudhury (2003), Collar (2006), Gaston *et al.* (1994), Grimmett & Robson (1986), Grimmett *et al.* (1998), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Islam (1993), Leonovich (1962), Martens & Eck (1995), Meyer de Schauensee (1984), Mishra (1997), Priemé & Øksnebjerg (1994), Raja *et al.* (1995), Rasmussen & Anderson (2005), Rasmussen (1992), Rasmussen (2004), Tattersall (1983), Ziswiler (1954), Ziswiler (1972), Zheng Zuoxin *et al.* (1983).

## 237. Striped Laughingthrush

### *Strophocincla virgata*

**French:** Garrulaxe flammé **German:** Strichelhäherling **Spanish:** Charlatán Rayado  
**Other common names:** Manipur (Streaked) Laughingthrush

**Taxonomy.** *Trochalopteron virgatum* Godwin-Austen, 1874, Razami, Naga Hills, Nagaland, India. Genus usually subsumed in *Garrulax*. Species sometimes placed in genus *Trochalopteron*. Monotypic.

**Distribution.** S Assam (N Cachar), Nagaland, Manipur and Mizoram, in NE India, and adjacent W Myanmar.



**Descriptive notes.** 23 cm. Fairly small, slim laughingthrush, brown with narrow whitish streaks above, with chestnut wings, buffy-white and rufous face, chestnut throat and whitish-streaked rufous-buff belly. Has crown to nape dull chestnut-brown, shading to more olive grey-brown on mantle, back and scapulars, all with long whitish shaft streaks, rump, uppertail-coverts and tail plain olive grey-brown; greater upwing-coverts whitish-tipped rich chestnut, with pale greyish outer primaries and chestnut wingpanel; supercilium from bill base buffy white, turning white posteriorly, lores rufous, upper ear-coverts dull chestnut-brown with

buffy streaks, submoustachial streak, cheek and lower ear-coverts buffy; chin, malar and upper throat rich chestnut, shading to rufous-chestnut and acquiring narrow whitish shaft streaks on lower throat and breast, streaks continuing onto pale rufous-buff belly and fading out on more richly rufescent lower underparts; iris brown to pale brown, sometimes yellowish, orbital skin dusky plumbeous; bill black to blackish-brown; legs flesh to pinkish-grey. Sexes similar. Juvenile is paler, more rufescent above than adult, with paler throat, no streaking on lower underparts. Voice. Song of two types, territorial in function, often given antiphonally by pairs. First type (probably by male) a clear, hurried “chwi-pieu”, “pi-pweu” or “wiwi-wew”, repeated every few seconds, alternatively as thin, sweet, quick, anxious-sounding whistle with short downslurred and then upslurred introductory note, “tui’téééé” (“ééé” strongly downslurred and ending abruptly at low point), or longer version with more and higher-pitched introductory notes. Second type (probably by female) a loud staccato rattling trill, usually with shorter introductory note, “cho-prrrrrr” or “chrrru-prrrrrr”, repeated after slightly longer intervals. Calls with mixed harsh “chit” and “chrrrrr” notes.

**Habitat.** Thick scrub, fern and grass cover near broadleaf evergreen forest, secondary growth, forest edge, abandoned cultivation; at 900–2400 m.

**Food and Feeding.** Mainly insects. Generally found singly or in pairs; not so gregarious as some laughingthrushes. Skulking.

**Breeding.** Apr–Jul. Nest reportedly a deep, rather neat, stoutly built cup, made of tendrils, creeper stems, dead bamboo and other leaves, grasses, roots, fine bents, bracken and moss, lined with fern roots and stalks, moss and grass roots, rootlets, fine grasses and feathery grass-tails, placed from near ground to 2–4 m up in thick bush, small tree or grass. Clutch 2–3 eggs, clear pale blue to pale blue-green. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Himalayas EBA. In India, locally not uncommon in Assam and common resident in Nagaland in 1990s, although exploited by cagebird trade; seen near Phawngpui (Blue Mountain) and in Murlen National Parks, in Mizoram. Common and evidently distributed throughout the Chin Hills in Myanmar, where fairly common in Natmataung National Park.

**Bibliography.** Ali & Ripley (1972), Berlioz (1930), Choudhury (2000, 2001, 2006), Godwin-Austen (1874), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Rasmussen & Anderson (2005), Robson (2000), Robson *et al.* (1998), Smythies (1986), Stattersfield *et al.* (1998), Stresemann & Heinrich (1940a), Stuart Baker (1893), Venning (1912).

## Genus *PTERORHINUS* Swinhoe, 1868

## 238. White-browed Laughingthrush

### *Pterorhinus sannio*

**French:** Garrulaxe à sourcils blancs **German:** Weißwangenhäherling **Spanish:** Charlatán Payaso  
**Other common names:** White-cheeked Laughingthrush(l)

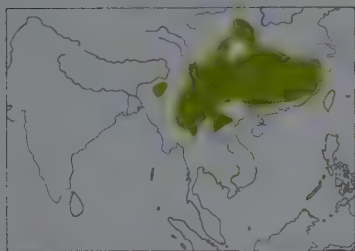
**Taxonomy.** *Garrulax sannio* Swinhoe, 1867, interior of Fujian, China. Genus normally subsumed into *Garrulax*; present species has recently been treated in *Dryonastes*. Four subspecies recognized.

#### Subspecies and Distribution.

*P. s. albosuperciliaris* (Godwin-Austen, 1874) – S Assam (N Cachar), Nagaland and Manipur, in NE India.  
*P. s. comis* (Deignan, 1952) – NE & E Myanmar, NW Thailand, N Laos, NW Vietnam (W Tonkin) and S China (W & C Yunnan).  
*P. s. oblectans* (Deignan, 1952) – SC China (SE Gansu and S Shaanxi S to SW Sichuan and E to W Hubei and N Guizhou).  
*P. s. sannio* (Swinhoe, 1867) – NE Vietnam (E Tonkin), and SE China from E Yunnan and Guizhou (except N) E to NE Jiangxi and Fujian.

**Descriptive notes.** 22–24 cm; 52–83 g. Rather small, dull brown laughingthrush with dark brown crown and area behind eye contrasting with white supercilium looping in front of eye to meet broad buffish-white cheek patch. Nominant race has crown rich dark brown, upperparts dull mid-brown with very vague darker streaks or lines, shading slightly olive lower down and on wing fringes, tail as crown, though sometimes paler, long supercilium, lores, cheek and moustachial area to lower ear-coverts whitish, upper ear-coverts bronzy dark brown, chin to breast warm mid-brown, paler and pinker on neck side and shading to buffish-olive on mid-belly and dull greyish olive-brown on flanks and thighs, vent cinnamon-buff; iris dull brownish-maroon to rufous-chestnut, orbital skin pale flesh-grey; bill blackish or horn-brown; legs grey to flesh-brown. Sexes similar. Juvenile has





harsh buzzy "dzwee" notes when agitated.

**Habitat.** Scrub and grass, secondary growth, bamboo thickets, open hillsides covered with bracken and wild bramble (*Rubus*) patches, open grasslands, cultivation borders. In Sichuan and Yunnan (China) occupies extensively modified habitats, even city parks and gardens, frequenting shrubs and flowerbeds. Found at 75–2600 m, but generally only 600–1830 m in India and SE Asia, though locally as low as 215 m in SE Asia.

**Food and Feeding.** Small molluscs, also grasshoppers and crickets (Orthoptera); also berries, seeds, rice, oats, and other vegetable matter. Forged singly or in pairs; usually in small noisy parties outside breeding season. Forages in undergrowth and on ground, searching through leaf litter. Less shy than most laughingthrushes.

**Breeding.** Mar–Aug; multi-brooded. Nest reportedly a fairly compact, thick-walled cup, made of grass, ferns, roots, bamboo and other leaves, rice and wheat straw, vines, and pine twigs, bound together with weed stems and tendrils, lined with fern roots and stems, tendrils, rootlets, fine grass, conifer twigs and needles, and bamboo leaves (some nests made almost entirely of bamboo leaves and grass), placed 0.6–6 m above ground in thick bush, brambles, mass of overhanging grass, reeds, bamboo, small sapling, tree, occasionally in roof of building. Clutch 3–4 eggs (usually 3 in Myanmar, 4 in China), pale blue or beautiful soft blue-green to delicate greenish-white, or white; incubation by both sexes, period 14–17 days; nestlings fed by both sexes, nestling period 12 days.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Current status in NE India uncertain, with no recent information. Moderately common to very numerous in S China, where recorded in 12 (22%) of 54 surveyed sites (of which 52 are nature reserves); abundant c. 90 years ago in SE Yunnan. Population in Hong Kong (of captive origin) scarce, local and much reduced; decline may reflect occupation of preferred habitats by *Leucodioptron canorum* and *Garrulax perspicillatus*. Generally locally common to common in SE Asian range. Reputed to be a pest in crops and fruit orchards.

**Bibliography.** Ali & Ripley (1972), Anon. (2004c), Berlioz (1930), Bingham (1903), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paoli (1960, 1962), Cheng Tsohsin *et al.* (1963), Cook (1913), Corlett (1998), Cox *et al.* (1992), David-Beaulieu (1944), Davidson (1998), Deditius (1897), Delacour & Jabouille (1931a), Godwin-Austen (1874), Grimmett *et al.* (1998), Harrington (1914a), Hewson (1983), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Hume (1888), King (1987, 1989a), Kinnear (1929), La Touche (1923, 1925–1930), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Nguyen Duc Tu *et al.* (2001), Rasmussen & Anderton (2005), Riley (1926), Riley (1952), Robson (2000), Round (1983), Smythies (1986), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stuart Baker (1893), Tan Yaokuang & Cheng Tsohsin (1964), Tizard *et al.* (1997), Traylor (1967), Vaurie (1954b), Viney *et al.* (1994), Vo Quy (1971), Wang Zhijun & Wei Tianhao (1983), Wickham (1929), Wu Zhikang *et al.* (1986), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zhao Xiubi (1994), Zheng Zuoxin & Qian Yanwen (1973).

## 239. Plain Laughingthrush

### *Pterorhinus davidi*

**French:** Garrulaxe de David **German:** Davidhäherling **Spanish:** Charlatán de David  
**Other common names:** (Père) David's Laughingthrush, Peking Laughingthrush, David's Babbler

**Taxonomy.** *Pterorhinus davidi* Swinhoe, 1868, Peking (Beijing), Hebei, China. Genus normally subsumed into *Garrulax*. Several further races proposed, including *funehris* (from NE Qinghai), *exspectatus* (NW Gansu) and *chinganicus* (N Hebei E to NW Manchuria), but differences negligible or undetectable in larger samples. Two subspecies recognized.

**Subspecies and Distribution.**

*P. d. davidi* Swinhoe, 1868 – NC & NS China from NE Qinghai (Qinghai Hu region and Lenglong Ling) E to NE Hebei, extreme SW Liaoning and N Henan (Taihang Shan); also, apparently disjunctly, in NE Nei Mongol.

*P. d. concolor* (Stresemann, 1923) – N Sichuan (Songpan region S to Baoxing) and adjacent E Qinghai (Baima region), in SC China.



**Descriptive notes.** 23–25 cm; 52–69 g. A medium-sized featureless laughingthrush, plain grey-brown with curved yellow bill, grey wingpanel and mostly blackish tail. Nominate race has crown and upperparts uniform brownish mid-grey with faint pinkish-lavender tinge, upperside slightly darker with grey edges of inner primaries, tail as wing basally but becoming blackish on distal third; long narrow bristles overlap nostril, lores and feathers above and below eye mottled blackish and thinly whitish (especially over eye), supercilium from eye to over ear-coverts paler and buffier than upperparts, ear-coverts as upperparts; bristly chin blackish-brown, submoustachial area and upper throat pale brownish-grey with dark brown shaft streaks, underparts pale brownish-grey, slightly darker on flanks and vent; iris greyish-brown to light brown; bill bright yellow, culmen and tip dull yellowish-green; legs dark reddish-grey. Sexes similar. Juvenile is slightly browner than adult. Race *concolor* is slightly greyer and less brown overall than nominate. Voice, Song loud, sweet and warbling, varied and melodious, "wiau wa-wikwikwik woiwoitwoitwoit". Usual call a musical "di dio dio", and for contact and alarm a series of "wiau" notes.

**Habitat.** Scrub-forest, thickets and low bushes, often along streams, willows and bushes along rivers and on hills near rivers, moor-like terrain, mountain slopes, brushwood and scrub oak on dry hillsides; at 1600–3300 m, occasionally down to 800 m.

brown parts noticeably more rufescent, and lacks vague mantle streaks. Race *oblectans* is like nominate, but without shift to buffish-olive on lower upperparts; *comis* has head markings more buffy white; *albosuperciliaris* has crown and upper ear-coverts paler, colder brown. Voice, Harsh, shrill, explosive "tcheu" or "tchow" notes, "tcheu...tcheu...tcheu..."; pair-members may call antiphonally. Alarm call a harsh "tcheurrrr" or "chrrrrrik", sometimes a continuous grumbling "chrrreerraow", interspersed with shrill, sharp "chrrr-ik...chrrr-ik..."; also described as repeated loud, harsh, emphatic, downslurred "jhéw" and "jhéw-jhu";

**Food and Feeding.** Insects, including scaly-winged insects, grubs, also fruit and various seeds, including cultivated millet (*Pennisetum glaucum*); mostly vegetable matter and seeds in winter. Forages in pairs or in small parties of 3–7 individuals.

**Breeding.** Apr–Sept; multi-brooded. Nest an untidy, shallow cup, made of dry grass blades and stems, dead leaves, small twigs and roots, lined with very fine rootlets and fibres or grass stems and feathers, placed in low bush. Clutch 3–6 eggs, plain turquoise-blue. No other information available.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Considered to be relatively uncommon throughout large range.

**Bibliography.** Bangs & Peters (1928), Berlioz (1930), Cheng Tsohsin (1987), Deditius (1897), Hornskov (1991), La Touche (1925–1930), Lönnberg (1924), Meyer de Schauensee (1984), Shaw Tsenhwang (1936), Sien Yaohua *et al.* (1964), Stone (1933), Stresemann (1923c), Vaurie (1954b), Wilder & Hubbard (1938), Yang Guisheng & Xing Lianlian (1995), Zheng Zuoxin & Qian Yanwen (1973).

## Genus *IANTHOCINCLA* Gould, 1835

## 240. Snowy-cheeked Laughingthrush

### *Ianthocincla sukatschewi*

**French:** Garrulaxe de Sukatschew **German:** Kansuhäherling **Spanish:** Charlatán de Sukatschew  
**Other common names:** Sukatschew's Laughingthrush

**Taxonomy.** *Trochalopteron Sukatschewi* Berezowski and Bianchi, 1891, Hsiku and Minchow districts, southern Gansu, China.

Genus traditionally subsumed in *Garrulax*. Monotypic.

**Distribution.** S Gansu and N Sichuan, in C China.



**Descriptive notes.** 27–31 cm. Medium-sized laughingthrush, dull olive-grey above, dull pinkish-brown with rufous-ochre "trousers" below, white cheek outlined in blackish, grey wingpanel, white tips of tertials and tail. Has crown to back and scapulars medium olive-grey with faint pinkish-brown tinge, becoming warmer, tinged ochrous-olive, on lower back, with fluffy pale buffy rump and dull rufous-ochre uppertail-coverts; upperside and tail brownish-grey, fringes of primaries grey and olive and tips of tertials white, central tail feathers olive, next pair grey basally, outer rectrices with white tips; lores and eyestripe

to above rear ear-coverts sooty brown to blackish, topped by pale greyish-brown tinge on forehead and supercilium; cheek and basal ear-coverts white, distal ear-coverts sooty brown and linking with eyestripe and sooty-brown submoustachial stripe; chin to belly pale pinkish-brown, richer behind rear ear-coverts, lower belly, flanks, thighs and vent rufous-ochre; iris reddish-brown; bill dark horn, yellowish-green base; legs pale rose-grey. Sexes similar. Juvenile apparently undescribed. Voice, Song a repeated, shrill "hwii-u, hwii-u" or "h'wi-i, h'wi-i" etc. Also utters grating, scratchy chattering.

**Habitat.** Bushy understorey, scrub and bamboo thickets in coniferous and mixed broadleaf-coniferous forests, dense roadside secondary growth, stunted broadleaf forest at treeline, spruce and willow scrub in river valleys; at 2000–3500 m.

**Food and Feeding.** Insects, seeds and berries; earthworms, strawberries, small red berries and green insect larva seen fed to nestlings. Forages mostly on or close to ground, digging among moss and dry leaf litter, but occasionally ascends trees to c. 3–5 m.

**Breeding.** May–Jun. One nest was a cup of grass and stems, lined with thin twigs, placed 2.5 m above ground in pine tree; five others were 1.2–2.8 m up in branches of spruce tree or willow shrub. Clutch 3 eggs, pale greenish-blue. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Central Sichuan Mountains EBA. Population estimated at 2500–9999 individuals; geographical range estimated at 29,000 km<sup>2</sup>. Records indicate that this species may occur at moderate densities in suitable habitat, but localized distribution and small number of known localities (eleven; five known to be occupied since 1980) suggest that it could have a small population which is likely to be declining. Main threat likely to be rapid loss and fragmentation of forest since late 1960s through exploitation for timber and clearance for cultivation and pasture; substantial areas of temperate forest must have been lost. Recorded from Jiuzhaigou, Wanglang and Baihe Nature Reserves, in Sichuan, and Lianhuashan Nature Reserve, in Gansu. Several protected areas established for giant panda (*Ailuropoda melanoleuca*) contain habitat suitable for this laughingthrush, but its distribution and abundance in these is poorly known.

**Bibliography.** Anon. (2006d), Bangs & Peters (1928), Berlioz (1930), Bi Zhongli *et al.* (2003), Butcher & Stattersfield (2004), Collar *et al.* (2001), Deditius (1897), Dresser & Delmar-Morgan (1899), Li Guizuan *et al.* (1993), Lönnberg (1924), Meyer de Schauensee (1984), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Zheng Zuoxin *et al.* (1987).

## 241. Moustached Laughingthrush

### *Ianthocincla cineracea*

**French:** Garrulaxe cendré **German:** Grauhäherling **Spanish:** Charlatán Cenicento  
**Other common names:** Ashy/Black-capped Laughingthrush

**Taxonomy.** *Trochalopteron cineraceum* Godwin-Austen, 1874, no locality = Thobal Valley, Manipur, India.

Genus traditionally subsumed in *Garrulax*. Race *cinereiceps* highly distinctive, and possibly a separate species, but intergrades with *strenua* in S China; study needed in order to determine width and length of zone of intergradation, and hence to decide whether or not species status warranted. Individuals of this species in SC & SW Sichuan have not been assigned to race. Three subspecies currently recognized.

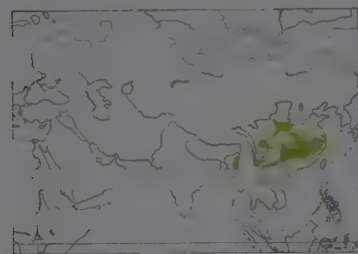


**Subspecies and Distribution.**

*I. c. cineracea* (Godwin-Austen, 1874) – NE India (Nagaland, Manipur, Mizoram) and W Myanmar (Chin Hills).

*I. c. strenua* (Deignan, 1957) – NE Myanmar and S China (N & W Yunnan).

*I. c. cinereiceps* (Styan, 1887) – C & E China from S Gansu E to W Shanghai, NW Fujian and N Guangdong, and N & E Sichuan S to S & SE Yunnan and Guizhou; also, apparently disjunctly, in NW & W Shanxi.



**Descriptive notes.** 21–24 cm; 43–55 g. Sandy-brown laughingthrush with black crown, moustache and tail tips and greyish-white head side. Nominative race has black on crown to nape extending in point onto mantle, upperparts buffy grey-brown, becoming slightly paler on rump and uppertail-coverts; upperside with black primary coverts and grey wingpanel, flight-feathers mostly with broad black tips, tertials with black subterminal marks and narrow white tips, tail rufescent grey-brown with broad blackish subterminal and whitish tips; face (lores, broad supercilium, cheek and ear-coverts) grey-tinged buffy-whitish and bisected by

narrow blackish postocular eyestripe; moustachial stripe blackish, submoustachial area pinkish-buff, both breaking into blackish streaks adjoining buffy-white chin and upper throat; lower throat and breast pinkish-buff, belly buff, lower flanks, thighs and vent dull ochre; iris creamy yellow to pink-orange-buff, orbital skin dusky, bill blackish to dull yellowish-brown, paler on lower mandible; legs pale fleshy or greyish-brown. Sexes similar. Juvenile is much more rufescent overall than nominate, lacks head pattern except for postocular stripe. Race *strenua* is like nominate, but has supercilium darker and more buff brown, deeper vinous-pinkish wash on breast; *cinereiceps* has very different head pattern, with dull grey on crown merging into colour of (warmer, darker) upperparts, dull chestnut supercilium and ear-coverts with no postocular streak, dark brown flecking on pale vinous moustachial and submoustachial area, also pale vinous chin to breast. Voice. Song not certainly documented. Calls include brash, rather high-pitched, quickly repeated upslurred short chirrs “pr’r’r’r’ip”, sometimes interspersed with hard chuckling staccato notes.

**Habitat.** Thickets and brambles at edges of broadleaf evergreen forest and mixed broadleaf-coniferous forest, secondary growth, abandoned cultivation, scrub and grass, bamboo, sometimes close to villages; avoids primary forest. At 1280–1830 m in India, 1220–2500 m in Myanmar, 200–1750 m in China, but said to occur at 2135–2745 m in NW Yunnan.

**Food and Feeding.** Small beetles (Coleoptera) and other insects, also seeds, berries and small fruits. Keeps in pairs in breeding season; otherwise in small parties, associating with *Leucodioptron canorum* in S China. Forages mostly on ground. Observed to turn over heaps of buffalo dung in search of food.

**Breeding.** Mar–Oct. Nest reportedly a compact but often flimsy cup, made of moss, leaves, rootlets, grasses and fine twigs, lined with rootlets or fine black and brown stems, tendrils, grasses and moss roots, placed 1–2 m above ground in thick bush or fork of bamboo. Clutch 2–4 eggs (often 2 in Myanmar), blue or plain greenish turquoise-blue; in captivity, incubation by both sexes, period 14 days, chicks left nest at 13–17 days. Brood parasitism by Common Hawk-cuckoo (*Cuculus varius*) reported in India.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Status uncertain in India, with few recent records suggesting scarcity. Uncommon in Myanmar. Fairly common across large range in China, including at Emei Shan Protected Scenic Area, in Sichuan.

**Bibliography.** Ali & Ripley (1972), Bangs (1921), Berlioz (1930), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Deditius (1897), Godwin-Austen (1874), Grimmett *et al.* (1998), Hopwood & Mackenzie (1917), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Kaspar (2005), King (1987, 1989a), King & Zheng Guangmei (1988), La Touche (1899, 1925–1930), Lewthwaite (1996), Liu Kezhi *et al.* (1994), Meyer de Schauensee (1984), Rasmussen & Anderson (2005), Riley (1926), Ripley (1952), Robson (2000), Smythies (1986), Stresemann (1923c), Stresemann & Heinrich (1940a), Stuart Baker (1893), Uchida & Kuroda (1916), Vaurie (1954b, 1959), Wang Zhijun & Wei Tianhao (1983), Wickham (1929), Wu Zhikang, Lin Qiwei *et al.* (1986), Wu Zhikang, Yang Jiongli & Xu Weishu (1981), Yu Zhiwei *et al.* (1986), Zheng Zuoxin & Qian Yanwen (1973).

## 242. Rufous-chinned Laughingthrush

*Ianthocincla rufogularis*

French: Garrulaxe à gorge rousse German: Rostkinnhärherling Spanish: Charlatán Golirrufo

**Taxonomy.** *Ianthocincla rufogularis* Gould, 1835, Sikkim, Himalayas, India.

Genus traditionally subsumed in *Garrulax*. Proposed race *grosvenori* (from W Nepal) synonymized with *grosvenori*. Six subspecies recognized.

**Subspecies and Distribution.**

*I. r. occidentalis* E. J. O. Hartert, 1909 – NE Pakistan (Murree Hills) E in Himalayas to W Nepal.

*I. r. rufogularis* Gould, 1835 – C Nepal F to Bhutan and NE India (C Arunachal Pradesh).

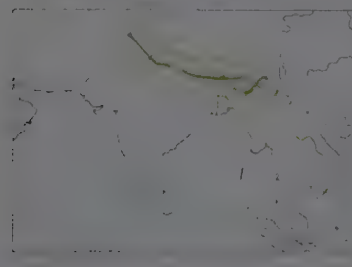
*I. r. rufogularis* Koele, 1952 – Meghalaya, in NE India.

*I. r. rufiberbis* Koele, 1954 – NE India (SE Arunachal Pradesh), N & NE Myanmar and S China (W Yunnan).

*I. r. assamensis* E. J. O. Hartert, 1909 – NE Indian hill states S of R Brahmaputra (except Meghalaya), and NW Myanmar.

*I. r. intensior* (Delacour & Jabouille, 1930) – NW Vietnam (W Tonkin).

**Descriptive notes.** 23–25.5 cm; 58–73 g. Fairly large, dark-faced laughingthrush, olive-brown with black scales above, greyish-white with black spots below, with rufous chin and tail tips. Nominative race has crown black, postocular supercilium, neck side, nape and upperparts warm ochraceous to rufescent olive-brown with black tips (creating effect of stripes, scales), warmer on uppertail-coverts; tail yellowish-brown with broad blackish subterminal band and broad chestnut tips; greater and median uppertail-coverts broadly tipped black, primary coverts blackish, tertials and secondaries as upperparts with broad sub-



terminal black and narrow terminal white tips, primaries sometimes fringed pale grey; loreal area buff (forming buff lateral fan in front of eye), area around eye sooty grey, narrow postocular eyestripe black, ear-coverts blackish-rufous, cheek and broad submoustachial area to behind lower ear-coverts blackish with sparse buff flecks and breaking up into black spots down breast side; chin variably rufous, this colour sometimes extending to upper throat, throat usually whitish, breast and mid-belly pale greyish, variably tinged buffy brown, mid-belly often paler, flanks greyish to warm mid-brown, breast, upper belly and flanks tipped with variably shaped black marks, vent rufous-chestnut; iris dark crimson-brown to purple-red, large orbital ring grey; bill horn-brown, paler on lower mandible; legs greyish-horn to pale horn. Sexes similar. Juvenile has reduced dark markings, particularly on crown and upperparts, with rufous edgings on secondaries and tertials, and more extensive rufous wash below; subadult female said to lack full black cap and to be more rufescent below. Race *occidentalis* is paler above and buffier below than nominate, ear-coverts warmer, rufous on chin paler and more extensive; *rufiberbis* is like previous above, fringes of wingpanel more buffy grey, ear-coverts paler rufous, whole throat and lores pale rufous, submoustachial black reduced and mixed with throat colour, underparts darker and more washed warm buff, black spots reduced; *rufiberbis* is more uniform grey, rufous of chin pale but restricted, upperparts brighter, larger black scaling; *assamensis* has chin and part of ear-coverts pale rust, black on throat side more extensive, upperparts generally more saturated; *intensior* is generally more contrastful, with lores as chin but not fan-like, more broadly blackish around eye, white tips on rear ear-coverts, faint scaling above, uppertail-coverts and tail deeper chestnut, submoustachial area more solidly black, underparts darker and greyer, tail with broader black subterminal band. Voice. Song a repeated loud, measured, clear, slightly husky “whi-whi-whu-whi” or “whi-whi-whi-whi”, with slightly higher penultimate or end note; has been described also as an anxious, strident, clear, highly modulated, whistled “fwhickit! ffwéér, fwer-fwéér” (first note highest, others mellower); or of 2–4 notes with first much burrier than others and last one lowest. Alarm an irregular series of harsh low notes run into short grating rattles; also, a curious low buzzing “jzzzzz”, otherwise described as a strangely jarring, steeply upslurred and then level-pitched twangy “gshwéé!”.

**Habitat.** Rather dense undergrowth in broadleaf evergreen forest (including oak and rhododendron forest), forest edge, secondary growth, scrub (including *Lantana camara*) and dense thickets (including those bordering hill cultivation); favours forest edge and regrowth on abandoned fields in Bhutan, where regularly found in areas with shifting cultivation. At 610–1980 m; locally to 2200 m in Bhutan and Nepal.

**Food and Feeding.** Insects, including wasps (Hymenoptera), also berries and seeds. Found in pairs or in small (family) parties. Forages mostly on ground and among low bushes.

**Breeding.** Apr–Sept in India and Bhutan; multi-brooded. Nest reportedly a fairly deep cup, made of creeper tendrils (these seem to be important), twigs, roots, scraps of bracken, sometimes dead leaves and grasses, lined with rootlets, fine black lichen fibres, black moss roots and scraps of dead leaves, placed 0.6–6 m above ground, usually in fork, in bush or tree. Clutch 2–4 eggs (usually 3 in India), pure white; incubation by both sexes, no information on duration; nestling period in captivity c. 12 days. Brood parasitism by Chestnut-winged Cuckoo (*Clamator coromandus*) and Large Hawk-cuckoo (*Cuculus sparverioideus*) reported.

**Movements.** Resident. In Bhutan, all records below 1000 m are during winter, suggesting some altitudinal dispersal, but this doubtful in view of relatively low elevational range of species.

**Status and Conservation.** Not globally threatened. Presumed extinct in Pakistan; no records since 19th century (1873). Local and frequent in Nepal. In Bhutan status somewhat difficult to assess, as species is less gregarious than most laughingthrushes and easily overlooked by observers; near Zhemgang, density of 1 territory/km of road at 1600–1900 m. Uncommon in India, where rare on New Forest campus at Dehra Dun and uncommon in Dehra Dun valley (Uttaranchal); present in Buxa Tiger Reserve (West Bengal). Generally uncommon in SE Asian range. Scarce in Fan Si Pan National Park, in Vietnam, with no recent records.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Berlioz (1930), Delacour & Jabouille (1930, 1931a), Dymond & Thompson (2000), Gaston (1989), Grimmett *et al.* (1998), Harrison (1962), Hume & Oates (1889), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), King *et al.* (2001), Koele (1954), Ludlow & Kinnear (1937, 1944), Mayr (1938), Mohan (1997), Rasmussen & Anderson (2005), Ripley (1952, 1961), Roberts (1992), Robson (2000), Simmons (1962), Singh, A.P. (2000), Singh, P. (1995), Smythies (1986), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1923), Stuart Baker (1893), Ward (1975).

## 243. Chestnut-eared Laughingthrush

*Ianthocincla konkakinhensis*

French: Garrulaxe du Kon Ka Kinh Spanish: Charlatán Orejicastaño  
German: Kastanienohrhärherling

**Taxonomy.** *Garrulax konkakinhensis* J. C. Eames and C. Eames, 2001, Mount Kon Ka Kinh (14° 19' N, 108° 24' E), Gia Lai province, Vietnam.

Genus traditionally subsumed in *Garrulax*. Monotypic.

**Distribution.** C highlands of Vietnam, and adjacent S Laos.



**Descriptive notes.** 24 cm. Forehead, crown and nape are grey with broad black tips, becoming mostly black on hindcrown and nape; mantle and upperside-coverts olive-buff, becoming warmer on scapulars to rump but all with heavy black scaling, uppertail-coverts rufous-brown, tail yellow-tinged rufous-brown with broad black subterminal band and white tips; primary coverts blackish, outer primaries fringed bluish-white, grading to olive-brown on inner primaries, and secondaries and tertials very broadly tipped black with pronounced white terminal fringes; lores and cheek buff, postocular supercilium grey, ear-coverts rufous-chestnut, black submoustachial stripe merging with black on throat side; chin and throat off-white, faintly buff-tinged and with irregular faint blackish conical or anchor-shaped marks that extend more heavily onto olive-buff neck side and breast side, mid-breast grey-washed buff, belly and flanks pale buffy rufous with vague sparse black bars, becoming paler and more rufescent on vent, iris brown to dark brown, upper mandible dark horn, lower mandible pale horn; legs flesh-horn. Distinguished from *I. rufogularis* by having all tail feathers tipped white, bluish-grey remiges with no black band, black-streaked grey forecrown and grey supercilium, and rich buff lower belly and vent, also all-chestnut ear-coverts, off-white throat, and extensive black tips on scapulars and tertials. Sexes similar. Juvenile has only little grey on rear supercilium. Voice. Song a sweet *Turdus*-like rambling series of fairly well-spaced and stressed notes, and some mimicry.



lasting c. 4–6 seconds; very different from that of *I. rufogularis*. Calls include low grumbling “rrreek, rrreek, rrreek...”.

**Habitat.** Broadleaf forest (including the bamboos *Arundinaria* and *Schizostachyum*), forest edge, secondary growth; recorded at 1350–1750 m.

**Food and Feeding.** Presumably invertebrates and some vegetable matter. Occurs singly, in pairs or in small (perhaps family) groups. Forages in understorey. Can be very skulking.

**Breeding.** Mar–Apr. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. The species occurs in three protected areas: Dong Ampham National Biodiversity Conservation Area, in Laos, and Ngoc Linh and Kon Ka Kinh Nature Reserves, in Vietnam. Its occurrence in logged forest and secondary habitats suggests that, unlike *I. rufogularis*, it is not a species requiring closed primary forest.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Eames & Eames (2001).

## 244. Barred Laughingthrush

### *Ianthocincla lunulata*

**French:** Garrulaxe à lunules **German:** Wellenhäherling **Spanish:** Charlatán Lunado  
**Other common names:** Bar-backed Laughingthrush

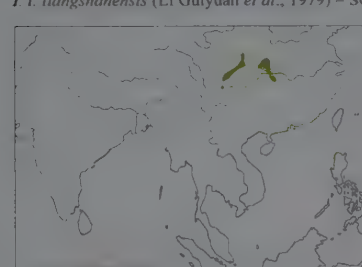
**Taxonomy.** *Ianthocincla lunulata* J. Verreaux, 1870, “les montagnes du Thibet chinois” = western Sichuan, China.

Genus traditionally subsumed in *Garrulax*. Forms a superspecies with *S. bieti*, and has been treated as conspecific. Two subspecies recognized.

**Subspecies and Distribution.**

*I. l. lunulata* J. Verreaux, 1870 – S Gansu, S Shaanxi, WC, N & NE Sichuan and W Hubei, in EC China.

*I. l. liangshanensis* (Li Guiyuan *et al.*, 1979) – SC Sichuan, in SC China.



**Descriptive notes.** 24–25 cm; 82 g. Medium-sized, soft-coloured laughingthrush, barred black and buff above, scaled white below, with tail tipped black and white. Nominant race has crown and nape grey-tinged milky brown, upperparts buffy brown with equally broad buff and blackish bars, primary coverts blackish-brown with white tips, pale grey wingpanel; central tail dirty buff-brown with blackish subterminal band and small white tip, outer feathers with stronger black and white tips and some adjacent grey; lores and area around eye whitish, this extending as short broad wedge behind eye (combination of whitish supercilium and upper ear-coverts), lower ear-coverts pale silky buff-brown; submoustachial stripe slightly darker than crown, but merging to pinky-greyish-tinged milky brown of throat and breast, breaking up through short white bars on breast to whitish belly; lower flanks and undertail-coverts generally warm buff with scattered dark bars; iris yellowish-white to white; bill greenish-yellow; legs flesh-coloured. Sexes similar. Juvenile apparently undescribed. Race *liangshanensis* has forehead, crown and nape blackish-brown, head side and chin to upper breast pale blackish-brown, neck side and lower breast also darker. **Voice.** Song a loud, clear and rather fluty “chu-wi”u-wu-whu”u”, repeated every 3–7 seconds; second bird, presumably female, adds quavering “tchrr-tchrr-tchrr-tchrr”. Song transcribed also as “wi-chu...wi-chu-chewee-chu”, with stressed “wi” notes.

**Habitat.** More open broadleaf and mixed broadleaf–coniferous forests, secondary forest, bamboo thickets, at 1200–3080 m, occasionally to 3660 m.

**Food and Feeding.** Presumably invertebrates and some vegetable matter; moths (Lepidoptera) reported. Rather quiet and unobtrusive, feeding mostly on ground.

**Breeding.** Jun. No other information.

**Movements.** Resident.

**Status and Distribution.** Not globally threatened. Formerly considered Near-threatened. Restricted-range species: present in Central Sichuan Mountains EBA. Relatively uncommon.

**Bibliography.** Anon. (2004c), Bangs (1932), Berlioz (1930), Deditius (1897), Li Guiyuan, Liu Liangxi *et al.* (1976), Li Guiyuan, Zhang Qingmao, Luo Jiaze *et al.* (1994), Li Guiyuan, Zhang Qingmao & Zhang Ruiyun (1979), Liu Rusun *et al.* (1998), Meyer de Schauensee (1984), Stattersfield *et al.* (1998), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zheng Zuoxin & Qian Yanwen (1973).

## 245. White-speckled Laughingthrush

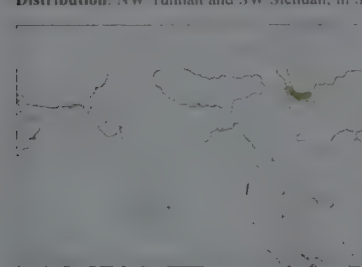
### *Ianthocincla bieti*

**French:** Garrulaxe de Biet **German:** Perlenhäherling **Spanish:** Charlatán de Biet  
**Other common names:** Biet’s Laughingthrush

**Taxonomy.** *Ianthocincla Bieti* Oustalet, 1897, Tzoku, north-western Yunnan, China.

Genus traditionally subsumed in *Garrulax*. Forms a superspecies with *I. lunulata*, and has been treated as conspecific. Monotypic.

**Distribution.** NW Yunnan and SW Sichuan, in S China.



**Descriptive notes.** 25.5 cm. Medium-sized, white-spotted yellowish-brown laughingthrush. Has crown to nape rich, dull rufescent mid-brown, tinged olive, upperparts similar but more ochraceous and each feather tip with prominent black band and white spot; tail ochraceous mid-brown with broad blackish-brown subterminal band and white tips; upperwing ochraceous mid-brown with dark and white tips and narrow grey wingpanel; primary coverts blackish-brown with dark and white tips; lores, area around eye, postocular eyestripe and rear ear-coverts whitish, rest of ear-coverts brown. Crown, chin, throat and

submoustachial area blackish-brown, upper breast similar with some yellowish-brown and increasingly large white crescents so that belly whitish; flanks yellowish-brown with dark-edged white

spots, thighs and vent dull yellowish-brown; iris pale yellow; bill dark horn-brown, paler tip and lower mandible; legs dull brown. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a loud, clear, descending “wi, wi-wi-wuu”, less descending “wi, ch’wi, wi ch’wu” and “wi, chiu-wu, wu-wu-wi” (rises towards end); in all cases, “wi” notes are louder and rising, and phrases are repeated 2–3 times.

**Habitat.** Recorded mainly in upper temperate and subalpine zones, in variety of forest habitats including bamboo and thickets in more open mixed coniferous–broadleaf forest, spruce–fir (*Picea–Abies*) and fir–rhododendron forest, at 2500–4270 m.

**Food and Feeding.** Invertebrates and fruit. No documented information on behaviour and habits; probably like those of *I. lunulata*.

**Breeding.** Undocumented.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Yunnan Mountains EBA. Population and range poorly known; former estimated at 2500–10,000 individuals and decreasing, latter estimated at 23,400 km<sup>2</sup>. Can occur at fairly high densities in suitable habitat, but paucity of records suggests a fragmented range and small population, both probably declining of twelve known localities for this species, only two (Ma Huang, in Sichuan; Lijiang–Jadu, in Yunnan) known to hold individuals since 1980. Main threat probably loss and fragmentation of forest. Logging in Yunnan caused decline of forest cover from c. 55% of land area in early 1950s to c. 30% in 1975. Similar rapid forest-cover declines in Sichuan since late 1960s driven by logging for timber and conversion to agriculture and pasture. Substantial areas of forest in upper temperate and subalpine zones must have been lost. Virtually all forest at Kianwu Liangshi, where species present in 1989, has been logged. This species is not recorded in any protected areas, but several reserves in Yunnan probably contain suitable habitat; these include Baima Xue Shan National Nature Reserve, Haba Xue Shan, and Bitahai and Yulong Xue Shan Nature Reserves.

**Bibliography.** Anon. (2006d), Berlioz (1930), Butchart & Stattersfield (2004), Collar *et al.* (2001), King (1989c), Meyer de Schauensee (1984), Riley (1926), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 246. Giant Laughingthrush

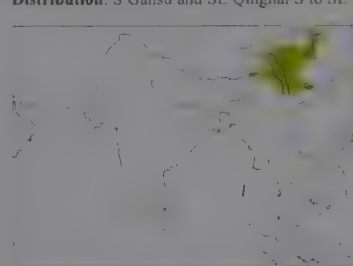
### *Ianthocincla maxima*

**French:** Garrulaxe géant **German:** Riesenhäherling **Spanish:** Charlatán Gigante

**Taxonomy.** *Pterorhinus maximus* J. Verreaux, 1870, “les montagnes du Thibet chinois” = Muping (Paohing), south-east Xizang, China.

Genus traditionally subsumed in *Garrulax*. Has been treated as conspecific with *I. ocellata*, and the two appear to intergrade between upper R Subansiri (India) and Tsangpo Valley, in SE Xizang (China). Monotypic.

**Distribution.** S Gansu and SE Qinghai S to SE & E Xizang and N Yunnan, in SC China.



**Descriptive notes.** 30.5–35.5 cm; 105–136 g. Very large dark-capped, chestnut-faced laughingthrush with white spotting above, buffy tan below. Crown and nape are blackish-brown, sharply changing to pale greyish buffy-brown on mantle and neck side, feathers with broad blackish subterminal bars and dot-like buffish-white tips, shading to rich dark chestnut on back, scapulars, rump and upper-tail-coverts, these patterned as mantle but with terminal dots mostly white; blackish upperwing-coverts tipped white, narrow grey wingpanel; tail blackish-chestnut with black subterminal bar and white tips; lores dirty

whitish to greyish, shading to rufous-buff supercilium, narrow postocular eyestripe blackish, ear-coverts to chin and throat chestnut-rufous, greyer and mottled around gape, upper breast chestnut-rufous with narrow buff and black scaling, becoming buff on mid-breast and shading to buffy tan on remaining underparts; iris pale grey to yellowish; bill horn-brown, lower mandible paler; legs brownish-flesh to yellowish-grey. Sexes similar in plumage, female slightly smaller than male. Juvenile has fewer, more triangular spots on back, unspotted rump and upper-tail-coverts, unbarred duller rufous on throat and breast, shorter tail. **Voice.** Song a repetition (with slight variations) of a loud, clear, sweet, quite rich and melodious, almost *Turdus*-like phrase, “chwi-chui-chwee-chwi”, with very short pauses, e.g. “chwi-chwi-chwi-chwi-wuu, wi-wiu-wi-wu”, “wuu-wuu, wiu-wuu...wi-wiu-wi-wiu-wiu” or “wi-wiu-wi-wi, chu-chui-chu-chui-chu-chui”; described also as loud rambling “tuhheet, tuhheet, fuoo, fweeo-fweo-fweo-fweeo”, a brief “fuiwit, fuiwit, fuiwéé”, and rhythmically repeated “fuiwit-fuiwit-fuiwéé-fuiwéé-fuiwit-fuiwit-fuiwéé-fuiwéé...”, and so on. Very like that of *I. ocellata*, but notes shorter, more modulated, and tempo faster.

**Habitat.** More open broadleaf and mixed broadleaf–coniferous forests, bamboo scrub in broadleaf evergreen forest, prickly oak (*Quercus*) forest with scattered conifers, relatively open broadleaf evergreen forest with willow-like understorey; at 2135–4115 m.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Secretive. Often associates with other laughingthrushes. Forages mostly on ground, occasionally ascending trees to 5 m.

**Breeding.** May–Aug. Nest a shallow cup of small twigs, lined with dry grass, placed 1–2 m above ground in bamboo clump. Clutch 2 eggs, blue. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally common.

**Bibliography.** Ali & Ripley (1972), Bangs & Peters (1928), Berlioz (1930), Cheng Foshin (1987), Deditius (1897), Dowell *et al.* (1997), Eck (1987), King (1989c), King & Peng Jitai (1991), Lee Ichhow *et al.* (1965), Lönngberg (1924), Ludlow (1951), McCarthy (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Riley (1926), Robson (1986), Schäfer & Meyer de Schauensee (1938), Sien Yachua *et al.* (1964), Stresemann (1923c), Ye Xiaodi & Wang Zuxiang (1993).

## 247. Spotted Laughingthrush

### *Ianthocincla ocellata*

**French:** Garrulaxe ocellé **German:** Waldhäherling **Spanish:** Charlatán Ocelado  
**Other common names:** Ocellated/White/White-spotted Laughingthrush

**Taxonomy.** *Cinclosoma ocellatum* Vigors, 1831, Himalayas = Darjeeling, West Bengal, India.

Genus traditionally subsumed in *Garrulax*. Has been treated as conspecific with *I. maxima*, and the two appear to intergrade between upper R Subansiri (India) and Tsangpo Valley, in SE Xizang



(China). Race *maculipectus* previously listed using older name *similis*; with inclusion of present species and *Trimalopis variegatus* *similis* in genus *Garrulus*, name *similis* became preoccupied, and was replaced by *maculipectus*; this made the name *similis* permanently invalid for the latter now known as *maculipectus*, even though herein the two forms are not treated as congeners. *Leucophaea rufescens*.

#### Subspecies and Distribution

*I. o. griseicauda* (Koele, 1950) – N India (Uttaranchal Pradesh) and W Nepal.

*I. o. ocellata* (Vigors, 1831) – C Nepal E to Bhutan, NE India (W Arunachal Pradesh) and adjacent S China (S & SE Xizang).

*I. o. maculipectus* Hachisuka, 1953 – N Myanmar and S China (W & NW Yunnan).

*I. o. artemisiae* (David, 1871) – EC China (S Gansu S to WC Sichuan and extreme NE Yunnan; W Hubei).



**Descriptive notes.** 30–33 cm; 104–136 g. Very large dark-capped laughingthrush with scaly pattern. Nominative race has crown to nape matt-black, neck side, mantle, back and scapulars greyish-buff with broad black subterminal bars and whitish terminal tips (giving black-and-white spotted effect), posterior upperparts and upperwing-coverts dull rufous-chestnut with same spotting effect; tertials dull rufous-chestnut with blackish-edged white tips, flight-feathers edged pale grey (pale wingpanel); central tail feathers dull rufous-chestnut with black tips, outer tail feathers dull rufous-chestnut basally, dull pale grey on mid-length, black-

ish subterminally and with broad white tips; lores, base of submoustachial area and broad supercilium pale rusty-rufous, ear-coverts, cheek and lower submoustachial area dull rufous-chestnut, neck side buffy tan with underlying black-and-white scaling; chin buffy ochre, throat to upper breast matt-black, upper breast feathers with long dull whitish to buffy tips (creating scaly effect), this pattern contiguous with neck side and continuing weakly down upper flanks, the tips broadening on lower breast so that rest of underparts plain buffy ochre, warmer on flanks; iris yellowish-white to yellowish; upper mandible brown, lower mandible bluish-white; legs flesh-white. Differs from similar *I. maxima* in having crown uniform black, lores chestnut-rufous, ear-coverts dark chestnut, cheek to chin and throat black, breast with black-and-whitish scaling, mantle and neck sides more rufescent, tail more square-ended. Sexes similar. Juvenile has head browner than adult, white spots

on upperparts smaller, absent on rump and uppertail-coverts, throat browner with less sharp edgings. Race *griseicauda* is like nominate but has more grey in tail, *maculipectus* has buffier supercilium and paler, rufous-chestnut ear-coverts, rufous colour extending to submoustachial area, more buff and fewer white spots on upperparts; *artemisiae* is like last, but almost lacks supercilium and has black ear-coverts (joining black on throat) with pale area behind, narrower and more extensive blackish barring below. **VOICE.** Song consists of repeated rich mellow fluty phrases, e.g. "wu-it, wu-u, wu-u, wi-u", "w'you, w'you, uu-i, w'you, uu-i" and "w'you, uu-wi'ii, uwa"; alternatively as mellow, leisurely, descending "fweér-fweér-fwúr-fwúr", and more strongly modulated "fuwéé-fuwéé-füu" or "fuwit-fuwéé, fuwit-fuwéé"; often joined by more jarring, rising "fu'u'wheen!" (first part slightly tremulous, second more nasal) from presumed females during duets. Calls include repeated, strident, screechy, guttural upsturred "schüwéé!".

**Habitat.** Undergrowth in high-elevation forest, light open mixed forest with undergrowth, thick rhododendron scrub and bushes bordering fields; at 2135–3660 m, rarely to 4100 m, and in China down to 1100 m. In Bhutan, mainly 2800–3200 m and favouring fir forest in summer; in winter, uses wider range of conifer habitats, including blue pine forest, down to 2200 m.

**Food and Feeding.** Insects, fruit and seeds; diet appears almost entirely vegetarian, but nestlings fed with insects. Inconspicuous. Keeps in pairs and in small family parties of 3–8 individuals; often associates with *Trochalopteron affine*. Forages on ground and in bushes.

**Breeding.** May–Jun in India and Xizang (S China). Nest reportedly a large, loose cup, made of twigs, dry grasses, bamboo leaves, roots, moss and ferns, lined with rootlets, placed within 2 m of ground in bush, small tree or clump of ferns and grass. Clutch at least 2 eggs, delicate pale blue or deep blue-green, sometimes few chocolate-brown specks. No information on incubation and nestling periods. Nestlings may leave nest long before full-grown.

**Movements.** Resident; winter dispersal to lower elevations reported from Bhutan.

**Status and Conservation.** Not globally threatened. Fairly common in Nepal, including in Langtang National Park. Frequent in Bhutan, but usually singly or with very few together. Fairly common in India, where present in and/or near Eaglenest Wildlife Sanctuary, in Arunachal Pradesh. Fairly common in N Myanmar and in China.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Anon. (2004c), Bangs (1932), Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Choudhury (2003), Dowell *et al.* (1997), Eck (1987), Gaston (1989), Grimmett *et al.* (1998), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Hume & Oates (1889), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), King (1989b), Kleefisch (2004), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), McCarthy (2006), Meyer de Schauensee (1984), Neff (2004), Rasmussen & Anderson (2005), Robson (2000), Rothschild (1926), Singh (1995), Smythies (1940, 1949), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stevens (1923), Stresemann (1923c), Zhang Quntan *et al.* (1994), Zheng Zuoxin *et al.* (1983).











Songs of first type described also as a striking, rich wolf-whistle, "wheéééééééééé!" (upsturred and then downslurred at very beginning, rest strongly upsturred), with simpler and also more complex variants. Calls include fairly short subdued buzzy "jrrrrr-rrr-rrr..." and harsh, rather liquid, quite buzzy "chee-cher-rrrr" or "jo-jorrrrr"; also as complaining, buzzy "bzze-zrrr-zrrr-zrrr" (downslurred notes), often in short bursts, and sometimes ending with prolonged, descending musical, hollow chirring: "chrr-chrr-rrrr-rrrr".

**Habitat.** Rather dense understorey and undergrowth of more open broadleaf evergreen forest, secondary growth, scrub and bushes bordering forest, bamboo, often near streams, at 900–2440 m; locally is common 500 m in SE Arunachal Pradesh (India).

**Food and Feeding.** Insects, berries and seeds. Usually found in pairs or in small family parties, occasionally singly; in Bhutan, may occur in small flocks of up to ten individuals in Jan–Apr. Known close to ground in dense cover, very skulking.

**Breeding.** Apr–Jul. Nest reportedly a bulky, compact or loose cup, made of dry bamboo or other leaves, creepers, tendrils, fine twigs, grasses, roots and moss, lined with black fibrous roots, black fibres and rootlets, placed 1.2–1.8 m above ground in bush or tangle of creepers. Clutch 2–4 eggs, usually 3, bright pale, somewhat greenish-tinged blue to deep blue. No information on incubation and nesting periods. Brood parasitism by Chestnut-winged Cuckoo (*Clamator coromandus*) occurs.

**Movements.** Resident; some dispersal to lower elevations in mid-winter noted in Bhutan.

**Status and Conservation.** Not globally threatened. Scarce and local in Nepal. Frequently recorded in Bhutan in C & E valleys; near Zhemgang, density of 0.6 territories/km of road noted at 1600–1900 m. In India, uncommon in Himalayas but more frequent in NE hills, with populations present in Buxa Tiger Reserve, in West Bengal, and in Eaglenest Wildlife Sanctuary, Mouling National Park and Namdapha National Park (scarce), in Arunachal Pradesh. Rare in China. Generally uncommon in SE Asian range.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Berlioz (1930), Birand & Pawar (2004), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Pao-lai (1960), Choudhury (2003), Delacour & Jabouille (1931a), Fiseher (1995), Grimmett *et al.* (1998), Harrington (1909), Hume & Oates (1889), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Katti *et al.* (1992), Meyer de Schauensee (1934, 1984), Rasmussen & Anderton (2005), Ripley *et al.* (1991), Robson (2000), Singh (1995), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1923), Stuart Baker (1893), Wang Zhijun & Wei Tianhao (1983).

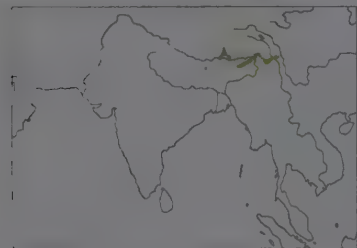
## 251. Brown-cheeked Laughingthrush

### *Trochalopteron henrici*

**French:** Garrulaxe de Henri **German:** Prinzenhäherling **Spanish:** Charlatán de Henri  
**Other common names:** Prince Henri's/Henry's Laughingthrush

**Taxonomy.** *Trochalopteron henrici* Oustalet, 1892, "So", Tibet; error = Aio and Sutu, Xizang, China. Genus traditionally subsumed in *Garrulax*. Has been considered conspecific with *T. elliotii*, although differences considerable, and also with geographically distant *T. morrisonianum*. Form described as "gucenense", from Chayul Valley, in Qamdo (SE Xizang), has been judged to be a hybrid between present species and *T. elliotii*. Monotypic.

**Distribution.** S & SE Xizang (from Mt Everest region E to R Salween), in S China; one record extreme NE India (NE Arunachal Pradesh).



**Descriptive notes.** 24.5–26 cm; 60–70 g. Medium-sized brownish-grey laughingthrush with blue-grey wings and long and heavily graduated white-tipped tail, chocolate-chestnut mask and bold whitish malar. Crown and upperparts are dull brownish-grey, upperwing with black primary coverts, flight-feathers with slate-coloured tips and blue-grey fringes, dull rufous-brown patch on primary bases; tail blue-grey with bold white tips; mask (lores to top of eye, ear-coverts, cheek and upper submoustachial and malar areas) chocolate-chestnut, bordered vaguely above by indistinct white supercilary line (sometimes absent), below by bold whitish

lower submoustachial and malar stripe extending under ear-coverts; chin and throat brownish-grey, becoming paler and greyer on breast and flanks, with very indistinct brownish streaking on breast, mid-belly with rufous tinge, shading to mid-chestnut on lower flanks, thighs and vent; iris crimson; bill pinkish-brown to nut-brown; legs lead-grey to dull pinkish-brown. Sexes similar. Juvenile is browner than adult. **Voice.** Songs clear and repeated every 4–10 seconds, "wichi-pi-choo", "whi-pi-choo" or "whi-choo-it", often given antiphonally with a cheerful "dieu-dieu" or "peu-peu" (presumably from females); song has been described also as a loud, clear, slurred, whistled "fwéééa-tiyúúú".

**Habitat.** Scrub and bushes, including pea trees (*Caragana*), bordering forest and in gulleys, open forest, human habitation and crop fields, in both arid and moister areas; at 1980–4570 m.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Found in pairs during breeding season, otherwise in small parties, sometimes associating with *T. affine*. Forages mostly on ground.

**Breeding.** May–Jul. Nest described as a rather untidy cup made of dried grass, dead leaves, strips of birch bark and moss, lined with dry twisted grass, placed in bush or hedge not far above ground; up to 80% of nests found in same species of plant as that used for nesting by *Babax waddelli*. Clutch 2–3 eggs, pale blue with sparse dark markings, said to be like those of *T. erythrocephalum*. No other information.

**Movements.** Resident. Presumably some minor altitudinal movements.

**Status and Conservation.** Not globally threatened. Locally common in Xizang, where density in excess of 2 birds/ha, much higher than that of *Babax waddelli* (which likewise confined to Tibetan Plateau). In adjacent NE India, probably a rare resident in NE Arunachal Pradesh, where one record (Jan 1995).

**Bibliography.** Ali & Ripley (1972), Berlioz (1930), Grimmett *et al.* (1998), Li Dehao *et al.* (1978), Lu Xin (2004), Ludlow (1951), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Oustalet (1893), Rasmussen & Anderton (2005), Robson (1986), Zheng Zuoxin *et al.* (1983).

## 252. Elliot's Laughingthrush

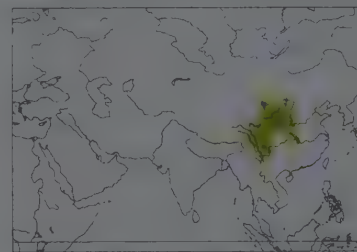
### *Trochalopteron elliotii*

**French:** Garrulaxe d'Elliot **German:** Elliotthäherling **Spanish:** Charlatán de Elliot

**Taxonomy.** *Trochalopteron elliotii* J. Verreaux, 1870, "les montagnes du Thibet chinois" = western Sichuan, China.

Genus traditionally subsumed in *Garrulax*. Has been considered conspecific with *T. henrici*, although differences considerable; form described as "gucenense", from Chayul Valley, in Qamdo (SE Xizang), has been judged to be a hybrid between these two. Proposed races *prjevalskii* (from E Qinghai and Gansu E to Hubei, S to N Yunnan and W Guizhou) and *bonvaloti* (from near Lamda, Xizang) regarded as indistinguishable from birds elsewhere in range. Monotypic.

**Distribution.** China from E Qinghai and adjacent N Gansu (SE Qilian Shan) E to SW Nei Monggol (Helan Shan), S to SE Xizang, C Yunnan, W Guizhou, S Ningxia, S Shaanxi and W Hubei, and extreme NE India (extreme E Arunachal Pradesh).



**Descriptive notes.** 23–25.5 cm; 40–72 g. Medium-sized long-tailed laughingthrush, grey-brown with pinkish-grey crown, golden-olive wing and tail fringes and chestnut vent. Crown is pinkish-tinged milky grey, shading to dull brownish olive-grey on upperparts, with tiny dull greyish and dark spots scattered on mantle; outer primaries edged whitish-grey, inner primaries edged orangish, rest of upperwing with yellow-tinged golden-olive fringing, greyish tertials; tail greyish with strong golden-olive wash, most intense along outer edges of feathers, tips white; face (lores, supercilary area, cheek and ear-coverts) blackish brownish-grey; chin, submoustachial area and neck side to belly pinkish-tinged greyish-brown, with tiny dotted whitish edges on feathers of neck side and breast side, lower belly and thighs pinkish-chestnut, vent chestnut; iris whitish-yellow to dark cinnamon; bill blackish; legs fleshy-yellowish. Sexes similar. Juvenile lacks white specks on shoulders and mantle. **Voice.** Song loud, clear and quite high-pitched, usually consisting of 3-note phrases repeated at intervals of 3–9 seconds, the final note often with somewhat wavering quality, e.g. "whi-pi-piu", "whi-pi-piuw" or "whi-pi-piuru", sometimes accompanied by an antiphonal "peu-peu-peu" (presumably from female); songs have been described also as a loud, elastic, clear whistled "fwééé-aa-wóó" (first note greatly stressed) repeated every few seconds, a quicker, more evenly stressed "fwééé-úú-wit", and a more broken-up "fuwít, tiyútiyú". Calls include subdued and quite high-pitched chuntering.

**Habitat.** Thickets, undergrowth and bamboo at or above timber-line, more open broadleaf forest, mixed broadleaf-pine forest and juniper forest; often close to human habitation, gardens, crop-field borders, etc. At 1000–4200 m; occupies one of the widest altitudinal ranges of any laughingthrush.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Occurs singly, in pairs or in small parties, sometimes in larger groups of up to 20 individuals in winter. Forages typically on or close to ground. Quite confiding near human settlements. Habits identical to those of *T. henrici*.

**Breeding.** Jun–Sept. Nest reportedly a fairly crude cup made of moss stalks, leaves and other dead vegetation, lined with fine twigs, placed 0.5–3.5 m above ground in small tree or bush. Clutch 2–3 eggs, pale blue-green with some blackish-brown spots and irregular lines. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common in China, e.g. at Emei Shan Protected Scenic Area, in Sichuan. Probably rare and local in India.

**Bibliography.** Anon. (2004c), Bangs & Peters (1928), Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Deditius (1897), Dowell *et al.* (1997), Grimmett *et al.* (1998), Hornslov (1991), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), King (1989a, 1989c), King & Peng Jitai (1991), Lee Tehhow *et al.* (1965), Li Dehao (1981), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao, Luo Jiaze *et al.* (1994), Li Guiyuan, Zhang Qingmao & Wen Anxiang (1993), Lönnberg (1924), Meyer de Schauensee (1984), Oustalet (1893), Rasmussen & Anderton (2005), Riley (1926), Robson (1986), Schäfer & Meyer de Schauensee (1938), Sien Yaohua *et al.* (1964), Singh (1995), Stone (1933), Stresemann (1923c), Tan Yaokuang & Cheng Tsohsin (1964), Vaurie (1972), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang, Lin Qiwei *et al.* (1986), Wu Zhikang, Yang Jiongli & Xu Weishu (1981), Ye Xiaodi & Wang Zuixiang (1993), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zheng Zuoxin & Qian Yanwen (1973), Zheng Zuoxin *et al.* (1983).

## 253. Variegated Laughingthrush

### *Trochalopteron variegatum*

**French:** Garrulaxe varié **German:** Buntflügelhäherling **Spanish:** Charlatán Variegado

**Taxonomy.** *Cinclosoma variegatum* Vigors, 1831, Simla, Himachal Pradesh, India.

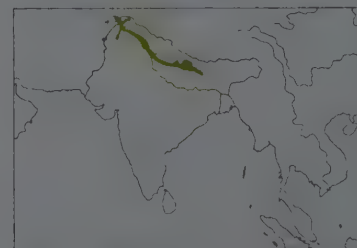
Genus traditionally subsumed in *Garrulax*. Three subspecies recognized.

**Subspecies and Distribution.**

*T. v. nurlistani* (Paludan, 1959) – NE Afghanistan.

*T. v. simile* Hume, 1871 – N & NE Pakistan E to N India (N Himachal Pradesh).

*T. v. variegatum* (Vigors, 1831) – S Himachal Pradesh E to Uttaranchal Pradesh, W & C Nepal and adjacent S China (S Xizang).



**Descriptive notes.** 24–26 cm; 57–79 g. Medium-sized olive and buffy laughingthrush with whitish lower face, broad black mesial stripe and grey, black and white wings and tail. Nominative race has forehead dull buff, shading to vaguely streaked pale brownish-grey on crown; upperparts ochre-tinged greyish-olive, upperwing with strong cinnamon fringes of greater coverts, black primary coverts and markings on bases of secondaries, black tertials with whitish on outer webs, pale grey and pale ochrous-grey wing fringing; blackish tail with broad greyish subterminal band and white tip; lores, spot at base of lower mandible and area

around eye (except for tiny white postocular flash) blackish, shading greyer on ear-coverts; rest of submoustachial area buff, shading backwards to whitish, with whitish-tipped blackish feathers on lower ear-coverts; chin and central throat blackish, breast and belly ochrous grey-brown or buffish-grey, shading to ochrous-rufous on lower belly, thighs and vent; iris pale yellow or pale yellow-green to pale yellowish-brown or brown, dull blackish to dark brown, yellow base of lower mandible; legs pale reddish orange-brown or pale brown to flesh-coloured. Sexes similar. Juvenile is slightly warmer and less distinctly patterned overall than adult. Race *simile* differs from nominate in having uniform silvery-grey fringing on outer tail, primaries and secondaries, paler and duller forehead, greyer upperside, breast and flanks, and whiter throat side; *nurlistani* is like last but greyer



overall, with darker crown and nape. **Voice.** Song consists of repeated loud, musical, far-carrying whistled phrases, e.g. "weet-a-weer", "weet-a-woo-weer", "zdeep-deeu-ee-weeh" and "deeo-pee-weeh", and shrill, musical "p'ti-pieyou" and "p'tee-weet". Songs have been described also as sweet, rich, hurried complex whistled phrases, consisting of strongly downslurred notes, preceded by a few quick introductory strokes, "chitilurk-fwüürk-(urk)" ("fwüürk" greatly stressed), and "fzeep, fwur-fwilliféer" (short, weak first note, others strongly upslurred and then downslurred, last 2 speeded up, prolonged). When alarmed, utters subdued muttering and squealing notes.

**Habitat.** Open forest of fir and birch or oak with dense rhododendron and ringal bamboo growth and bushes; dwarf rhododendron at or above tree-line, patches of *Viburnum* at forest edge, various types of dense jungle and undergrowth, particularly in winter, open willow groves; occasionally enters gardens. Found at 1800–4200 m in summer; some descend locally as low as 1000 m during extreme winter weather.

**Food and Feeding.** Insects, fruit and berries. In pairs during breeding season; otherwise in parties of up to 20 or more birds. Forages among bushes and on ground, but often ascends trees. Not shy.

**Breeding.** Apr–Aug. Nest described as a rather compact, sometimes untidy, but usually rather shallow cup, made of coarse grasses, dead leaves, strips of birch bark, roots, twigs, moss, finer and softer grasses and fir needles, lined with rootlets, fine grasses and pine needles, placed 0.15–6 m above ground in bush, small tree or lower branch of larger tree, sometimes in thick grass tuft. Clutch 2–5 eggs, usually 3–4, pale, rather dingy blue-green to blue, blotched, spotted and speckled with liver-red, reddish-brown, yellowish-brown, pale purple or purplish-red; incubation by both sexes. No information on duration of incubation and nestling periods. Occasional brood parasitism by Indian Cuckoo (*Cuculus micropterus*) reported.

**Movements.** Resident. Relatively minor altitudinal displacements during harsh winter weather; both nominate race and *simile* reported (sometimes in same flock) in winter from Kangra area of Himachal Pradesh, in India.

**Status and Conservation.** Not globally threatened. Locally common in Pakistan, and fairly common in Palas Valley, in North-West Frontier Province. Common in Nepal, with significant proportion of world population judged to be in Shey-Phoksundo National Park, where species is locally common. Locally fairly common in India; common in Nanda Devi Biosphere Reserve and fairly common in Dehra Dun valley, in Uttaranchal, and common (mainly in dense nullahs) in Majhatal Harsang Wildlife Sanctuary, in Himachal Pradesh.

**Bibliography.** Ali & Ripley (1972), Bates & Lowther (1952), Bertioz (1930), Fischer (1995), Gaston *et al.* (1994), Grimmett & Robson (1986), Grimmett *et al.* (1998), Hume & Oates (1889), Inskipp & Inskipp (1991), Martens & Eck (1995), Meyer de Schauensee (1984), Mishra (1997), Priemé & Oksnebjerg (1994), Raja *et al.* (1999), Rasmussen & Anderton (2005), Roberts (1992), Sankaran (1994), Singh (2000), Stuart Baker (1922), Zheng Zuoxin *et al.* (1983).

## 254. White-whiskered Laughingthrush

### *Trochalopteron morrisonianum*

**French:** Garrulaxe du Morrison **German:** Weißbarthäherling **Spanish:** Charlatán de Morrison  
**Other common names:** Taiwan Laughingthrush

**Taxonomy.** *Trochalopteron morrisonianum* Ogilvie-Grant, 1906, Mount Morrison, Taiwan. Genus traditionally subsumed in *Garrulax*. May form a superspecies with *T. affine*. Has been considered conspecific with latter or with *T. henrici*, but basis for such treatments poor. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 25–28 cm; mean 75 g. Fairly large laughingthrush, dark rufous-brown and grey with olive-gold wingpanel, white submoustachial stripe, and vague whitish scaling on upperparts and breast. Forehead is dull greyish-buff, shading to buffy grey on crown, to dull dark rufous with ochre tinge and indistinct narrow white scales on mantle and back, and to plain dark rufous-tinged olive-grey on rump and scapulars; primary coverts blackish, wing fringes and tertials mid-grey, with broad dull rufescent olive-gold wingpanel; tail like upwelling or darker grey, with extensive golden-olive on outer webs, brighter at base;

lores whitish, face (supercilium, ear-coverts, area round eye and cheek) dull dark chestnut, with white postocular lateral crownstripe and broad submoustachial stripe; chin and throat vaguely streaked ochrous-buff on dark brown, breast as mantle, mid-belly, flanks and thighs as rump, lower belly and vent pale chestnut; iris brown; bill pale brown; legs dark flesh. Sexes similar. Juvenile apparently undescribed. **Voice.** Song a rich clear whistle, "wit-chi'wi" or "wip-chi'ri", repeated every 3–5 seconds; sometimes answered with downward trill by another bird. Also has excited giddy laughter, "hee-hee-hee-hé, hee-hee", and melodious loud bell-like whistles, "di, di, di...". Very quiet "tsip" calls while foraging, also some quiet whistles and chirps.

**Habitat.** Undergrowth and lower tree stratum in coniferous forest, mixed broadleaf deciduous and coniferous forest, open forest with clearings, dwarf and secondary coniferous scrub, bamboo, junipers, shrubby by trails and mountain roads, near mountain cabins, brush above tree-line. Occurs at 1800–3300 m, some descending locally as low as 1000 m during hard winter weather; recorded between 1475 m and 3425 m in N Taiwan.

**Food and Feeding.** Primarily insects, berries, seeds and flower petals. Consumes more invertebrates and flower petals and takes larger food items (1–6 cm) in breeding season compared with non-breeding season. Also, exploits different parts of habitat inside breeding season: forages at both lower (0–2 m) and higher (8–14 m) levels than in non-breeding season, on shorter (0–2 m) and taller (6–14 m) plants, on smaller (0–5 cm diameter at breast height) and larger (15–40 cm) trees, and on smaller (0–1 cm diameter) branches. Also scavenges around rubbish piles. Males tend to forage higher up (above 8 m) in trees than do females; forages also on ground.

**Breeding.** Mar–Aug. Monogamous. Nest a cup made of grass blades, stems and roots, lined with rootlets, decorated with a few small leaves, placed c. 1.2 m above ground in areas in territory with highest tree density, or in bush. Clutch 2 eggs, pale milky blue to sky-blue, sparsely marked with greyish-black blotches. No other information.

**Movements.** Resident. Minor altitudinal movements recorded.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Taiwan FBA. Fairly common within elevational range; common, or more visible, in coniferous zones. In Yushan National Park, recorded densities of 2–47 birds/ha in grassland, 2–21/ha in pine woodland, 9–1/ha in mixed coniferous forest and 2–21/ha in spruce forest.

**Bibliography.** Bertioz (1930), Cheng Tsohsin (1987), Ding Tzungsu *et al.* (1997), Fang Woeihong (2005), Hachisuka & Udagawa (1950, 1951), Koh Chaonien & Lee Peifen (2003), Ogilvie-Grant (1906), Severinghaus & Blackshaw (1976), Stattersfield *et al.* (1998), Vaurie (1954b), Yang Xiuying (1991), Yen Chungwei (1990), Yu Shuchun (1999).

## 255. Black-faced Laughingthrush

### *Trochalopteron affine*

**French:** Garrulaxe à face noire

**German:** Schwarzscheitelhäherling

**Spanish:** Charlatán Carnegiro

**Taxonomy.** *G[arrulax] affinis* Blyth, 1843, central Nepal.

Genus traditionally subsumed in *Garrulax*. May form a superspecies with *T. morrisonianum*. Has been considered conspecific with latter, but basis for such treatment poor. Six subspecies recognized.

**Subspecies and Distribution.**

*T. a. affine* (Blyth, 1843) – W & C Nepal and adjacent S China (S Xizang).

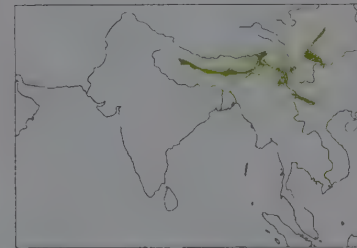
*T. a. bethelae* (Rand & Fleming, 1956) – E Nepal E to Bhutan and NE India (Arunachal Pradesh) and adjacent S China (S & SE Xizang).

*T. a. oustaleti* (E. J. O. Hartert, 1909) – N Myanmar and S China (NW Yunnan and adjacent SE Xizang).

*T. a. blythii* J. Verreaux, 1870 – S Gansu S to SW Sichuan (N of Muli region), in SC China.

*T. a. muliense* (Rand, 1953) – SW Sichuan (Muli Region) S to NW Yunnan (Lijiang Range), in S China.

*T. a. saturatum* (Delacour & Jabouille, 1930) – C & SE Yunnan and extreme NW Vietnam (NW Tonkin).



**Descriptive notes.** 24–26 cm; 52–85 g. Fairly large, dark brownish laughingthrush, scaled above and streaked below pale grey, with blackish-brown head and short rounded white submoustachial patch. Nominative race has crown dark brown, paler on nape, and rufescent mid-brown on mantle, shading to rufescent olive on upperparts with vague grey subterminal smudges and neat narrow dark scale-shaped tips; rump and uppertail-coverts dull pale chestnut; primary coverts black, flight-feathers fringed pale grey with broad golden-olive wing flash, tail dull golden-olive basally, grey distally; side of face (supercilium and rear lateral

eral crownstripe, lores, cheek and ear-coverts) blackish, with white vertical patch behind ear-coverts and bolder creamy-white drop-shaped upper submoustachial and malar patch; chin blackish, throat to lower submoustachial area and breast brownish-tan with buffier centres and greyish edges (creating indistinct streaks), shading on belly, flanks and vent to buffy olive; iris brown or olive-khaki; bill horn-black; legs pinkish-brown or horn-brown. Sexes similar. Juvenile is browner-crowned than adult, with no white neck patch, and more uniform brown body plumage. Race *bethelae* tends to be blacker-headed, browner-backed, with richer brownish-tan breast and more ochrous flanks and vent than nominate; *oustaleti* is like previous, but with darker grey streaking below and darker, more uniform underparts overall (pattern slightly more scaly); *saturatum* is very like last but darker and duller overall, more extensively blackish on head (black extending farther onto throat), white submoustachial and neck patch less extensive, outer fringes of secondaries duller; *muliense* has slightly greyer-tinged crown and greyer, floury wash on underparts, pattern scaller; *blythii* is like last, but browner on mantle, back, neck and underparts, with outer fringes of secondaries dull moss-green. **Voice.** Song consists of repeated loud, shrill, rather high-pitched, quickish phrases, e.g. "wiee-chiweeo", "wiee-chweeui" and "wiee-weeoo-wi" ("wiee" shriller, higher, rising), repeated every c. 7 seconds; those of race *bethelae* said to be richly modulated, strident, whistled "fwüweeo-wheoóóówhéet!" etc., may start with few higher, tinkly notes, e.g. "tertinkit-tutur-wheoóóówhéet!". Calls include continuous, rather high rattling, and low conversational chuckles, have been transcribed also as gruff low rattles that often begin or end in harsh metallic upslurs, e.g. "trrrrt, trrt, trrrrt-krvlt, trrrrt", wheezy, thin purrs and whines, and mewing. Very noisy when excited.

**Habitat.** High-altitude habitats, including bushy undergrowth in broadleaf evergreen, coniferous and mixed forest, scrub oak and bamboo in mixed oak and conifer, birch and fir or rhododendron forest, juniper and stunted rhododendron, conifer and birch thickets, bamboo, dwarf rhododendron and shrubby above timber-line. Found at 2350–4600 m (mainly above 2300 m), some descending locally in winter as low as 1630 m; in China, locally down to 1500 m during breeding and as low as 500 m in winter; in Bhutan possibly breeds only above 3000 m, and in winter apparently absent above 3200 m and found down to 1800 m (occasionally 1300 m).

**Food and Feeding.** Insects, including beetles (Coleoptera); also berries and fruits, including wild strawberries (*Fragaria*), crabapples (*Malus*) and ginseng (*Heptapleurum*), and seeds, including those of brambles (*Rubus*), aromatic wintergreens (*Gaultheria*) and viburnums (*Viburnum*). Noted also as feeding on a vervain (*Clerodendron*). Found in pairs during breeding season; otherwise in small parties, although up to 30 recorded together, and may associate with other species, including *Fulvetta vinipectus*, in bird waves. Forages on or near ground, and sometimes as high as crowns of small trees.

**Breeding.** Apr–Aug. Nest a large but neat cup, externally made of moss and fine twigs, internally of dry rhododendron leaves, root fibres and a few grass blades, lined with fungus rhizomorphs, root fibres and birch-bark paper, placed 1–2.5 m above ground in bush (e.g. rhododendron or viburnum). Clutch 2–3 eggs, blue to slightly greenish-blue with a few blackish-brown to purplish-black spots, blotches and scrawls; in captivity, incubation period 14–15 days, fledging period 14–16 days (sometimes to 21 days).

**Movements.** Resident; post-breeding altitudinal displacements at least in Bhutan, where occurs at lower levels Dec–Feb, and in China.

**Status and Conservation.** Not globally threatened. Common in Nepal, including Langtang National Park. Abundant in alpine and temperate zones in Bhutan. Common in India, where present in Buxa Tiger Reserve (West Bengal) and in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Locally common in SE Asian range. Generally uncommon in China.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Bertioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Choudhury (2003), Delacour & Jabouille (1930, 1931a), Dowell *et al.* (1997), Gaston (1989), Greenway (1933), Grimmett *et al.* (1998), Hewson (2006), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Katti *et al.* (1992), King (1989b), Kinnear (1934), Li Guiyuan, Liu Liangzei *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), McCarthy (2006), Meyer de Schauensee (1984), Osment (1902), Rand (1953), Rasmussen & Anderton (2005), Riley (1926), Robson (1986, 2000), Rothschild (1926), Smythies (1940, 1949), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1923), Stone (1933), Stresemann (1923c), Tan Yaokuang & Cheng Tsohsin (1964), Tynstra (1993), Zhang Quntan *et al.* (1994), Zheng Zuoxin *et al.* (1983).



**Descriptive notes.** 26 cm; 67–75 g. Variable dark laughingthrush with silvery-edged ear-coverts. Nomininate face has crown and nape chestnut, upperparts plain dark olive-tinged grey-brown, palest on mantle and neck side, greater upperwing-coverts chestnut-fringed brown, primary coverts black, flight-feather fringing and tail olive greyish-yellow; lores, frontal supercilium, cheek, malar and





chin blackish, rear supercilium and ear-coverts dull silvery with maroon streaks; lower throat and upper breast dull maroon, rest of underparts dirty ochrous-olive, shading darker lower down and greyer towards sides; iris greyish to dark brownish-grey; bill dark brownish; legs fleshy-brown to dark purplish-grey, sometimes tinged yellowish. Differs from similar *T. erythrocephalum* and *T. chrysopetrum* in unspotted back, dark primary coverts, more extensive silvery edges on ear-coverts, dark-streaked grey supercilium spreading to upper neck side, black chin and malar area, and olive-tinged lower underparts. Sexes similar. Juvenile apparently undescribed. Race *ramsayi* is like nominate, but has brighter greenish wing fringing, more extensive and brighter yellowish-tan on lower throat to belly; *schistaceum* is purer grey above and on belly, with very slight scaly effect on breast, blacker-tinged ear-coverts; *subconnectens* has dusky-brown ear-coverts with silvery edgings, tan-washed olive-grey breast and belly with scaly brownish-grey edges (creating distinct scaly effect); *connectens* resembles last, but scaly effect below even more pronounced, has yellowish-olive wing fringing (including primary coverts). Voice. Song in NW Thailand loud and quite liquid "wi-wiwioo", "wu-weeoo" or "tu-tweeoo", with more emphasis on first note, repeated every 2–10 seconds. Also a quickly delivered "u-wip-weeoo", with faint introductory note; "weeoo-wiwip", with rising first note; sometimes a very fast "wiu-wip" or "wip-wip". Moaning, slightly husky, clear mewing "weeaa-ao", "waaaow-ow", "waaaa" or "aoaaaa" may be given antiphonally (presumably by female).

**Habitat.** Broadleaf evergreen, pine and mixed broadleaf-pine forests, secondary growth, scrub and grass, bamboo brakes; at 1065–2565 m, but down to 610 m in S Myanmar (C Tenasserim). **Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Typically encountered when foraging singly, in pairs or in small groups, on or close to ground; occasionally ascends moss-cloaked and lichen-covered tree branches. **Breeding.** Mar–Aug. Nest, built by both sexes, a bulky well-made deep cup, of moss and/or dry leaves, lined with black hair-like fungus, placed in fork of sapling or tree branch, in tangle of creepers or in tree-fern or bamboo. Clutch 2 eggs (C Tenasserim), sky-blue with sepia blotches and spots. No other information.

**Movements.** Resident. **Status and Conservation.** Not assessed. Generally common. Rare in Yunnan, in China. In Thailand, common in Doi Chiang Dao Wildlife Sanctuary and Doi Inthanon and Doi Suthep-Pui National Parks. Common in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. Present in Pu Mat Nature Reserve and common in Fan Si Pan National Park, in Vietnam. **Bibliography.** Berlioz (1930), Bingham (1903), Cheng Tsohsin (1987), Collar (2006), David-Beaulieu (1944), Davidson (1998), Deignan (1938, 1963), Delacour & Jabouille (1931a), Eames *et al.* (2001), Evans & Timmins (1998), Hopwood (1919), Hume & Davison (1878), Lekagul & Round (1991), Meyer de Schauensee (1934, 1946, 1984), Oates (1894), Peng Yanzhang *et al.* (1979), Riley (1938), Rippon (1901), Robertson (1993), Robson (2000), Rothschild (1926), Smith *et al.* (1940, 1943), Smythies (1986), Tizard *et al.* (1997), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Wang Zhijun & Wei Tianhao (1983), Yang Lan (2002), Zheng Zuoxin *et al.* (1983).

## 259. Malayan Laughingthrush

### *Trochalopteron peninsulæ*

**French:** Garrulaxe de Malaisie **German:** Rostschulterhäherling **Spanish:** Charlatán Malayo

**Taxonomy.** *Trochalopteron peninsulæ* Sharpe, 1887, Larut Range, Perak, Peninsular Malaysia. Genus traditionally subsumed in *Garrulax*. Until recently, this species and *T. chrysopetrum*, *T. melanostigma* and sometimes *T. ngoclinhense* were regarded as conspecific with *T. erythrocephalum*. Monotypic.

**Distribution.** Extreme S Thailand and Peninsular Malaysia.



**Descriptive notes.** 25.5–26.5 cm; 58–72 g. Top of head is maroon-chestnut, edged slightly blackish on lores and superciliary area to above eye, with postocular superciliary area, neck side and nape dull dark silvery grey; upperparts dull olive-tinged chestnut-brown, tail dull slaty grey (with paler olive-tinged sheen in some lights); upperwing with greater coverts dark chestnut, primary coverts black, flight-feathers olive-green with greenish-yellow fringing; ear-coverts and cheek dark chestnut with pinkish-grey sheen, submoustachial area dull chestnut-brown with vague blackish flecking; chin to breast chestnut-brown, shading slightly to

more rufous-brown on belly and to rich dirty rufous-tinged greyish-brown on flanks, thighs and vent; iris yellowish to brown, indistinct white eyering; bill blackish; legs brownish-black to brown. Differs from similar *T. melanostigma* in having maroon-chestnut crown, reduced black on lores and chin, reduced silvery delineation of ear-coverts, dark silvery-grey hindcollar (extension from neck side), white eyering, plain dull chestnut-brown mantle and scapulars to upperpart-coverts, plain chestnut-brown throat to belly. Sexes similar. Juvenile has crown duller than adult, with grey patches on sides of neck less distinct and more suffused with brownish. Voice. Sings with clear and far-carrying "wip-weeoo" or "wiw-weeoo" and similar (with rising, stressed second note). Also a quickly delivered "wip-wi-eeoo" (short first note, somewhat rising middle note).

**Habitat.** Understorey and bamboo in broadleaf evergreen forest, secondary growth, scrub and grass, from 1065 m to at least 1830 m.

**Food and Feeding.** Mainly insectivorous, consuming beetles (Coleoptera) and grubs; seeds also eaten. Typically in pairs or in parties of 4–5 individuals. Forages usually on or near ground, but occasionally ascends trees.

**Breeding.** Jan–May. Nest a sturdy deep cup made of dry leaves, bryophytes, plant fibres and rootlets, lined with fine fibres, placed up to 1.5 m above ground in tree-fern, sapling or hanging lianas. Clutch 1–2 eggs, blue with a few blackish spots. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Common within rather restricted range; common e.g. at Bukit Fraser and in Taman Negara National Park at Mt Tahan.

**Bibliography.** Berlioz (1930), Collar (2006), Deignan (1963), Glenister (1951), Lekagul & Round (1991), Madoc (1956), Madoc & Allen (1952), Medway (1972), Medway & Wells (1976), Robinson (1928), Robson (2000).

## 260. Golden-winged Laughingthrush

### *Trochalopteron ngoclinhense*

**French:** Garrulaxe du Ngoc Linh **German:** Goldflügelhäherling **Spanish:** Charlatán Alidorado

**Taxonomy.** *Garrulax ngoclinhensis* J. C. Eames *et al.*, 1999, Mount Ngoc Linh, Kon Tum Province, Vietnam.

Genus traditionally subsumed in *Garrulax*. Closely related to *T. erythrocephalum*; has been treated as conspecific, but is strongly distinct. Monotypic.

**Distribution.** C highlands of C Annam, in Vietnam.



**Descriptive notes.** 27 cm. Medium-sized, dark grey, faintly scaly-breasted laughingthrush with chestnut crown and broad golden wing fringing. Forehead is dark grey with maroon tinge, forehead to mid-crown dark grey with blackish streaks, mid-crown to nape chestnut, richer towards rear; upperparts dark olive-tinged grey, upperwing with greater coverts broadly tipped chestnut, primary coverts black, flight-feather fringes golden-yellow; tail slaty, outer feathers with dull golden-ochre fringes; lores to above and below eye and chin blackish, shading to pinkish-stained darkish grey on ear-coverts and throat, to dark grey with broad mid-grey scaling on breast, and to plain dark olive-grey mid-belly and dark grey flanks, thighs and vent; iris dark brown to blackish; bill blackish-horn; legs dark brown. Sexes similar. Juvenile undescribed. Voice. Song undescribed. Only documented call is a double-noted, rather cat-like mewing "rr'raow-...rr'raow..." (first note short and descending, second note longer, rising, with slight downward inflection at end, and emphasized), with intervals of 2–3 seconds between each call.

**Habitat.** Understorey and bamboo in primary upper montane broadleaf evergreen forest (canopy height 10–15 m), at 2000–2200 m. **Food and Feeding.** No information on diet; probably invertebrates from leaf litter. So far noted only singly or in pairs; has been seen to associate with *T. mitnei*. **Breeding.** Male with gonads enlarged in May. No other information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Kontum Plateau Secondary Area (which now becomes a full EBA with discovery also of *Actinodura sodangorum*). Uncommon and local. Currently known only from Mt Ngoc Linh and Mt Ngoc Boe, on Kontum Plateau of C Vietnam, and inferred therefore to have a very small global range (estimated at 155 km<sup>2</sup>), but likely to occur also in neighbouring Attapu and Se Kong provinces of SE Laos. Population unknown. On Mt Ngoc Linh, known from Ngoc Linh Nature Reserve (Kontum province) and Ngoc Linh Proposed Nature Reserve (Quang Nam province). At former locality 13% of broadleaf evergreen forest was lost during 1976–1995, and forest at latter site is threatened by clearance for agriculture, a process that is accelerating in response to natural population growth and settlement of migrants in area.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar (2006), Collar *et al.* (2001), Eames (2001), Eames, Lê Trong Trại & Nguyễn Cu (1999), Nguyễn Cu *et al.* (2000), Robson (2000), Stattersfield & Capper (2000), Tordoff *et al.* (2000).

## 261. Collared Laughingthrush

### *Trochalopteron yersini*

**French:** Garrulaxe de Yersin **German:** Halsbandhäherling **Spanish:** Charlatán de Yersin

**Other common names:** Yersin's Laughingthrush

**Taxonomy.** *Trochalopteron yersini* Robinson and Kloss, 1919, Lang Bian Peaks, southern Annam, Vietnam.

Genus traditionally subsumed in *Garrulax*. Monotypic.

**Distribution.** S Annam, in Vietnam.



**Descriptive notes.** 26–28 cm. Strikingly patterned medium-sized laughingthrush with black hood, silvery-grey ear-coverts, bright rufous underparts and hindcollar, and golden-olive wing fringing. Has bristly lores, superciliary area, crown, nape, area behind ear-coverts, chin and throat black, postocular area and ear-coverts shiny silvery grey with vague blackish streaks; nape and upper mantle, neck side, breast, upper flanks and belly bright rufous, shading to ochrous dark grey on remaining upperparts (including median wing-coverts), and to ochrous dark brown on lower flanks, thighs and vent, greater upperwing-coverts rufous-chestnut, primary coverts black, flight-feathers ochrous dark grey with outer fringes semi-reflective grey-tinged golden-olive, tail ochrous dark grey with grey-tinged golden-olive on outer fringes of feathers; iris crimson, brown or hazel; bill black; legs dark brown. Sexes similar. Juvenile is patterned as adult, but chestnut areas paler and browner, grey of back replaced by purplish-brown. Voice. Song a loud, quite high-pitched, rising whistle repeated every 3–5 seconds, typically "wueeeoo" or "u-weeeoo" (rising in middle), "uuuu-weeoo" (rising more at start), "wiu-weeeu" (quick first note, stressed second note), or "wu-eyou" (rising sharply at end); variants include "weeoo-wiu", "yiuuuu-ee", "wuuuu-ip" and "wuuuu-oo" (last two heard in duet), sometimes a shorter "u-weeaa". Two or three birds may sing to each other. Whistles often answered antiphonally (presumably by females) with low, quite harsh, mewing "vaaaah", "ayaaa" or "ohaaaah" (these calls sometimes uttered on their own); short, breathless "phu" may also be given antiphonally with whistles. Alarm call a series of variable, subdued, slurred, buzzy, grating, slightly rising notes, "greet-greet-greet-greet-greet-greet-greet-greet-grrr-rr" (with last 3 or so notes slurred together).

**Habitat.** Understorey (usually rather dense) of primary broadleaf evergreen forest, thick regrowth in logged-over forest, scrub bordering forest; at 1500–2440 m.

**Food and Feeding.** No information on diet. Found in pairs or in small parties of up to eight individuals; relatively retiring. Forages low down in dense vegetation and on ground.

**Breeding.** Juveniles in Apr and Jun, suggesting breeding probably mainly Mar–May. No other information.



**Movements.** Resident.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in Da Lat Plateau EBA. Locally common in suitable habitat within its altitudinal range. Population estimated at 2500–9999 individuals and decreasing; occupied range estimated as being merely 720 km<sup>2</sup>. Recorded from at least eleven localities, with post-1980 records from eight, the most important appearing to be Mt Lang Bian, Mt Hi Doup and Chu Yang Sin Nature Reserve. Da Lat Plateau currently focus for a government resettlement programme, resulting in forest degradation and fragmentation through logging, shifting agriculture, fuelwood-collecting and charcoal production; this species, however, generally occurs at elevations rather higher than those where shifting cultivation currently practised. On Mt Lang Bian, all land below 1500 m is now logged or under cultivation. Species is present in Thuong Da Nhim Nature Reserve.

**Bibliography.** Anon. (2004d), Berlioz (1930), Butchart & Stattersfield (2004), Collar *et al.* (2001), Delacour & Jabouille (1931a), Eames (1995), Eames & Ericson (1996), Eames *et al.* (1992), Hill *et al.* (2001), Nguyễn Cu *et al.* (2000), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993a, 1993b), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

**262. Red-winged Laughingthrush***Trochalopteron formosum*

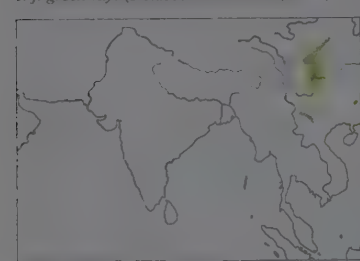
**French:** Garrulaxe élégant **German:** Prachthäherling **Spanish:** Charlatán Alirrojo  
**Other common names:** Crimson-winged Laughingthrush

**Taxonomy.** *Trochalopteron formosum* J. Verreaux, 1869, “le Thibet oriental” = western Sichuan, China. Genus traditionally subsumed in *Garrulax*. Individuals of this species observed in N Guangxi of unknown race; presumably belong with nominate. Two subspecies recognized.

**Subspecies and Distribution.**

*T. f. formosum* J. Verreaux, 1869 – N & C Sichuan and extreme NE Yunnan, and N Guangxi, in SC & S China.

*T. f. greenwayi* (Delacour & Jabouille, 1930) – S China (SE Yunnan) and N Vietnam (W Tonkin).



**Descriptive notes.** 27–28 cm; 83–106 g. Fairly large, dull rufous-brown laughingthrush with silvery grey and black on head and crimson fringing on wings and uppertail; crown feathers elongate and pointed. Nominat race has crown feathers blackish with broad silvery-grey edges (forming uneven streaks), shading to dull darkish rufous-brown on nape, neck side, scapulars and back, rump darker and more olive; upperwing blackish-brown with crimson primary coverts and broad fringing, tail crimson centrally, outer rectrices crimson on outer webs and blackish-brown on inner ones; bristles lores black, black extending over eye

in vague supercilium and continuing around ear-coverts, ear-coverts blackish with broad silvery-grey streaks, submoustachial area blackish with indistinct silver-grey flecks; chin, throat, lower neck side and breast matt black, becoming slightly scaly on lower breast, with transition to dull darkish rufous-brown on belly, which itself becomes more olive and then sootier towards vent; iris brown; bill black; legs dark brown to dark grey. Distinguished from similar *T. milnei* mainly by lack of chestnut crown and lack of whitish ear-coverts. Sexes similar. Juvenile is like adult. Race *greenwayi* is dull olive where nominate dull rufous-brown, has breast less extensively black, more dark-scaled with silvery edges. Voice. Song consists of repeated loud, rather thin, clear whistled phrases, “chu-weewu” or slightly rising “chiu-wee”. Possible duets (perhaps intra-sex) include “chiu-wee—u-weewoo” (second part rising slightly in middle) and “u-weewoo—wueewoo” (second part quickly delivered). Also a louder “wu-ecoo”.

**Habitat.** Broadleaf evergreen forest, secondary growth and scrub near forest, including prickly oak (*Quercus*), and bamboo; at 900–3150 m, but in Vietnam not recorded below 2400 m.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Usually forages in pairs or small parties, on or close to ground; also ascends to 4–5 m in small trees. Shy and skulking.

**Breeding.** Jun–Jul. Young fed by both sexes. No other information.

**Movements.** Resident. Irregular, minor, local altitudinal movements, particularly during heavy snowfall, considered possible.

**Status and Conservation.** Not globally threatened. Formerly considered Near-threatened. Restricted-range species: present in Central Sichuan Mountains EBA and Fan Si Pan and Northern Laos Secondary Area. Rare in China, but fairly common at Emei Shan Protected Scenic Area, in Sichuan. Scarce at high levels in Fan Si Pan National Park, in Vietnam.

**Bibliography.** Berlioz (1930), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Delacour & Jabouille (1930, 1931a), Dowell *et al.* (1997), Huang Qiang *et al.* (1995), King (1989a), Lee Kwok Shing *et al.* (2006), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Lieberman (1984), Meyer de Schauensee (1984), Robson (2000), Stattersfield *et al.* (1998), Stresemann (1923c), Zhang Quntian *et al.* (1994).

**263. Red-tailed Laughingthrush***Trochalopteron milnei*

**French:** Garrulaxe à queue rouge **German:** Rotschwanzhäherling **Spanish:** Charlatán Colirrojo

**Taxonomy.** *Trochalopteron Milnei* David, 1874, western Fujian, China.

Genus traditionally subsumed in *Garrulax*. Population in C highlands of Vietnam (C Annam) and presumably adjacent SE Laos probably represents an undescribed race, or possibly belongs with *viryi*. Four subspecies recognized.

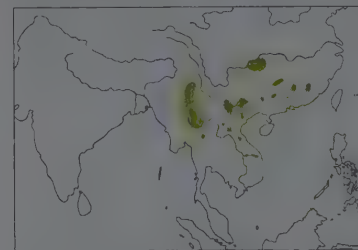
**Subspecies and Distribution.**

*T. m. sharpei* Rippon, 1901 – N & E Myanmar, NW Thailand, N & C Laos, NW Vietnam, and S China (W, S & SE Yunnan, W Guangxi).

*T. m. sinianum* Stresemann, 1930 – SE China (SE Sichuan, N Guizhou, C & NE Guangxi, S Hunan, N Guangdong).

*T. m. milnei* David, 1874 – NW Fujian, in SE China.

*T. m. viryi* (Delacour, 1932) – S Laos (Bolovens Plateau).



**Descriptive notes.** 26–28 cm; 66–93 g. Medium-sized dull ochrous-grey laughingthrush with bright rufous-chestnut crown, blackish face, whitish ear-coverts and crimson wings and tail. Nominat race has crown to nape bright rufous-chestnut, shading abruptly to ochre-stained mid-grey neck side, mantle and back with wide dark scaling, darker and plainer ochrous on rump and uppertail-coverts; upperwing fringes extensively crimson, tail duller greyish-crimson; face (lores to above eye and upper submoustachial area) blackish, ear-coverts whitish; chin and upper throat blackish, shading to grey-scaled olive on lower

throat and breast and plain greyish-olive on lower underparts; iris crimson to hazel or dark brown, orbital skin grey; bill black; legs black or dark purplish-grey. Sexes similar. Juvenile is like adult. Race *sharpei* is like nominate, but ear-coverts silvery; *sinianum* is slightly paler-crowned, more silvery-eared and blacker-throated, with breast and underparts much greyer; *viryi* is like last, but breast extensively scaled blackish, birds in C Annam and adjacent S Laos having paler throat and breast with more pronounced scalloping. Voice. Sings with clear loud whistled phrases, e.g. “uuu-weewoo”, “eeoo-wee” or shorter “uuuwi” (all rising at start), or “uuuu-hiu-hiu” and “uuuu-hiu-hiu-hiu”, with slightly rising introduction and faster, soft laughter at end.

**Habitat.** Understorey of broadleaf evergreen forest (including dry degraded tracts), dense secondary growth, bamboo forest and patches, cane-brakes, scrub and grass near forest, at 610–2500 m (mainly above 900 m). Seen in scrub in Thailand; in Laos only in hill evergreen forest (including where *Fokienia* dominant), although not in forest isolates.

**Food and Feeding.** Insects, including beetles (Coleoptera), also small centipedes (Chilopoda); also berries and fruits of *Saurauja* (Theaceae). Forages in pairs or in small parties of 2–4 individuals, rarely quite large parties; usually 2–5 m above ground, sometimes lower, or on ground itself. Often very skulking in dense vegetation.

**Breeding.** Apr–Jun. Nest, constructed by both adults, a tidy cup made of bamboo leaves and grasses, lined with roots, placed up to 1 m above ground in bush or against side of tree. Clutch 2–3 eggs, white, sparingly spotted and blotched with dark red, reddish-brown or blackish, sometimes with a few purplish undermarkings; in captivity, incubation period 17–18 days and nestling period 14–16 days; nestlings fed by both parents.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Nominat race apparently rather uncommon and restricted in range, and species in general considered local and uncommon to rare in China; recently recorded in Diding Nature Reserve, in Guangxi, but at best uncommon there. Scarce to uncommon in SE Asian part of range. In Laos, historically common on Bolovens Plateau above 800 m but very rare in Tranninh; currently common in Dong Hua Sao National Biodiversity Conservation Area (NBCA) above 1100 m, present (common above 1000 m) in Nakai-Nam Theun NBCA, and present and probably common in Xe Sap proposed protected area. In Vietnam, locally common in Fan Si Pan National Park and present in Na Hang and Vu Quang Nature Reserves.

**Bibliography.** Anon. (2004c), Berlioz (1930), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dickinson (1970), Eames *et al.* (2001), Engelbach (1932), Evans & Timmins (1998), Haines (1989), Harrington (1909, 1914a), Hill (2000), La Touche (1899, 1925–1930), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Liu Kezhi *et al.* (1994), McLeod (1996), Meyer de Schauensee (1934, 1946, 1984), Oldenettel (1989a), Robbins *et al.* (2006), Robson (2000), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Smythies (1940, 1949), Stanford & Mayr (1941), Stanford & Tiechurst (1938), Thewlis, Duckworth *et al.* (1996), Thewlis, Timmins *et al.* (1998), Timmins & Wilkinson (1996), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Uchida & Kuroda (1916), Wang Zhijun & Wei Tianhao (1983), Wickham (1929), Wu Zhikang *et al.* (1986).

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## PLATE 19

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *LIOCICHLA* Swinhoe, 1877

#### 264. Crimson-faced Liocichla

##### *Liocichla phoenicea*

French: Garrulaxe à ailes rouges

Spanish: Charlatán Carirrojo

German: Sikkim-Karminflügelhäherling

Other common names: Red-faced Liocichla, Crimson-winged Laughingthrush

**Taxonomy.** *Ianthocinclia phoenicea* Gould, 1837, Nepal.

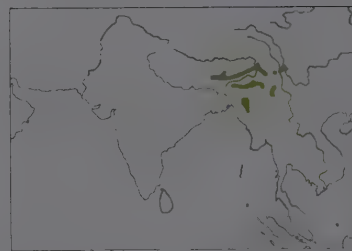
Has been treated in expanded genus *Garrulax*, but placement in present genus supported by recent molecular studies. Often treated as conspecific with *L. ripponi*. No definite records from Nepal, despite type-locality restriction (although "Nepal" specimens exist). Individuals at Gongshan, in NW Yunnan (China), of uncertain race, presumed to belong with nominate. Two subspecies recognized.

##### Subspecies and Distribution

*L. p. phoenicea* (Gould, 1837) - Sikkim and N West Bengal E to Bhutan and NE India (Arunachal Pradesh) and adjacent N Myanmar and S China (Gongshan, in extreme NW Yunnan).

*L. p. bakeri* (I. J. O. Hartert, 1908) - Meghalaya, S Assam (N Cachar), Nagaland, Manipur and Mizoram, in NE India, N Myanmar (W & S parts) and adjacent S China (W Yunnan).

**Descriptive notes.** 21–23 cm; 42–53 g. Fairly small laughingthrush-like babbler, mostly plain brown but with crimson face and throat, pale, bold black lateral cross-stripe and scarlet in wings and tail. Nominative race has crown and upperparts olive-brown, rufescent tinge posteriorly becoming chestnut on upperparts, coverts, upperparts, complex in coloration, with chestnut greater coverts and outer fringes of secondaries and tertials, primaries with scarlet fringes, secondaries pale-tipped and with narrow, pale grey outer edges basally and scarlet edges distally. Ilii blackish with broad tips dull ochraceous, tertiaries dark crimson, lateral crown-stripe black, face (supraorbital area, area around most of eye, postocular superciliary area and ear-coverts) and neck side crimson; chin



to flanks and thighs ochraceous olive-brown, with mid-grey belly and scarlet-tipped black undertail-coverts; iris crimson or dark crimson to reddish-brown, orbital skin dull lead-grey; bill dark brown to black; legs horn to brown. Sexes similar. Juvenile has duller face than adult, upperparts less rufous, lateral crown-stripe less distinct, rufescent tail tip less sharply defined, iris brown. Race *bakeri* has slightly greyer crown than nominate, slightly darker and less extensive red on head, little rufous or chestnut tinge on rear upperparts, slightly paler and browner underparts, extensive grey on centre of abdomen. Voice: Has

loud, beautiful, clear, cheerful song of repeated phrases of 5–8 notes (sometimes shortened to 3), last part usually rising but sometimes falling. Phrases include e.g. "che-wi-ter-twi-twitoo", "chi-cho-choe-wi-chu-choe", "chi-wee-ee-wee-wee" and "chi-cho-ee" etc. Songs of nominate race described also as "tyu, tiyuu, tyuu, fwhee-tyu" (slightly downslurred, except penultimate note), "tee, tyu-tuu, ti-tuu-fwheee" (end note richer, more strongly upslurred), and "tutui-tui-twee-tyuu"; those of *bakeri* as more deeply slurred "tui-tui-fwée-tyuu" and "tyu-fwée-tyu f66-tiwi". Calls with harsh grating rasping notes, e.g. "chrrrt-chrrrt" and buzzy, upslurred grumbling "grsh! grsh!".

**Habitat.** Dense undergrowth in broadleaf evergreen forest, dense thickets of secondary growth bordering cultivation and streams, grass, scrub; in Bhutan appears to require large areas of intact broadleaf forest (no records from more fragmented tracts). At 500–2500 m (chiefly 1200–2000 m), mainly above 900 m.

**Food and Feeding.** Insects, berries and seeds. Usually found singly, in pairs or in small groups of 4–5 individuals, depending on season (small flocks of up to five usually found only from Jul in Bhutan); sometimes associates with other species in bird waves. Very skulking and unobtrusive. Typically feeds in undergrowth and on ground, sometimes in open. Occasionally ventures into trees, and has been observed 10 m up in fruiting tree.





**Habitat.** Inhabits undergrowth of secondary broadleaf evergreen forest, dense young secondary growth, scrub and grass, bamboo thickets, replanted forest, and dense vegetation in more open forest; appears to prefer early successional habitats. Present at 600–2400 m; perhaps commonest at 1700–2200 m.

**Food and Feeding.** Fruit and invertebrates. Occurs singly, in pairs or in small family groups. Rather skulking, though not particularly shy. Forages in low thick vegetation up to 4 m above ground.

**Reproduction.** May–Jun; in captivity multi-brooded. Nest a robust cup with untidy base, made of moss, small twigs, dead bamboo and other leaves, grass stems, and roots, lined with fine dead grasses and roots, and woven around several fine dead bamboo shoots, completely shielded from above by row of bamboo leaves, or placed in bush 0.3–1 m above ground. Clutch 3–4 eggs, pale sky-blue to bright blue, irregularly marked with long reddish-brown to dark red-brown squiggles, lines and spots. In captivity: incubation probably by both sexes, period 13 days from final egg laid; nestling period 12–15 days.

**Movements.** Resident or partial elevational migrant; all records during summer are from above 1000 m, and once found at 600 m in Jan.

**Status and Conservation.** VULNERABLE. CITES II. Restricted-range species: present in Chinese Subtropical Forests EBA. Known from at least 14 sites in Sichuan and two in Yunnan. Locally common at Emei Shan Protected Scenic Area (a sacred mountain and therefore subject to only limited forest clearance) and in Xiaoxiang Ling and Daliang Shan range; in one study a mean density of 0.596 birds/ha was estimated, with 0.9 birds/ha in secondary forest and 0.502 birds/ha in primary forest; recorded also in Mabian Dafengding Nature Reserve. Is generally, however, highly localized within small range, suggesting that total population is small and probably declining. Although not a primary-forest species and probably thrives in secondary habitats, main threat is loss and fragmentation of suitable habitat, much of which has already been cleared or degraded, through logging and conversion to agriculture. Trapping for export as cagebirds may also be a minor threat, although this is a protected species in Sichuan. Since 1999, the export of wild birds from China has been banned, but law may be difficult to enforce.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Cheng Tsohsin *et al.* (1963), Collar *et al.* (2001), Delacour (1933), Dowell *et al.* (1997), Huang Qiang *et al.* (1995), Meyer de Schauensee (1984), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

## 268. Taiwan Liocichla

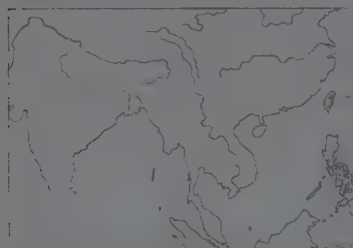
### *Liocichla steerii*

**French:** Garrulaxe de Steere **German:** Formosahäherling **Spanish:** Charlatán de Steere  
**Other common names:** Steere's Liocichla/Babbler

**Taxonomy.** *Liocichla steerii* Swinhoe, 1877, mountains of southern Taiwan.

Closely related to *L. omeiensis*, and in the past often treated as conspecific with it; these two and *L. hugunorum* may form a superspecies. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 17–19 cm; mean 32 g. Small, small-billed, green-and-grey laughing-thrush-like babbler with bright yellow loreal patch, black brow and rufous wing patch. Male has forehead olive-yellow, crown dark slate, becoming blackish laterally over eye (extending to frontal supercilium) and merging on mantle into greyish-olive, warmer and browner on scapulars, greyer on rump; tail warm greyish-olive with broad slate-grey subterminal marks and narrow whitish tips; flight-feathers fringed yellowish-olive, with black ends and narrow white tips, tertials bright rufous on outer webs; lores to anterior cheek bright yellow.

low or sometimes orange-yellow (forming distinctive downslanting oblong preocular patch), narrow yellow postocular supercilium breaking up into elongate flecks on neck side; ear-coverts, hindcheek and submoustachial area brownish-olive, malar area and chin to breast slaty grey; breast and mid-belly yellow-olive, flanks, lower belly and thighs slaty grey with whitish tinges, undertail-coverts blackish with yellow tips; undertail yellowish-olive; iris dark brown, narrow orbital skin pale bluish-grey; bill blackish-brown; legs flesh-brown. Female closely resembles male but slightly smaller, with smaller yellow loreal patch. Juvenile apparently undescribed. Voice. Vocalizations divided into nine types. Song (male territorial call) a high-pitched rapid "tssi, ti'wuu" or "tswi, ti'wuu" (short sharp introductory note, longer and slightly quavering "wuu"), typically repeated every 5–8 seconds; female response to this a slower, buzzy chirp, so that due transcribed as "hui-dididu dddzddz" or "swiya-swiya jrzz-jrzz-jrzz"; male song variable, sometimes with more syllables, variation tends to follow geographical pattern (some populations generally using a given number of syllables, others another). Other calls comprise two types of alarm call, also fighting call, escape call, distress call, social call and chick begging call; one of these (probably an alarm, as conversational excitement) is a conversational buzzy rasping, of varying lengths and strengths, "djrrr... djrrr... djrrr... djrrr...".

**Habitat.** Broadleaf evergreen forest and mixed broadleaf-coniferous forest, forest edge, tangled shrubbery, and orchards, at 1200–3000 m; in N Taiwan, elevational limits 830–2780 m.

**Food and Feeding.** Insects, including grasshoppers (Orthoptera); worms; also small fruits, berries and seeds. In winter, may rely heavily on food discarded by tourists at certain sites, and recorded even as feeding on remains of dead conspecifics. Forages in low vegetation, typically below 2 m on plants less than 4 m tall, and on shaded damp ground. Not particularly shy. Typically occurs singly, in pairs, or in small groups; occasionally joins bird waves.

**Breeding.** Mid-Mar to mid-Aug/Sept. Nest a cup made of bamboo leaves, moss, bark, roots and dead leaves, lined with fine grass, fine roots, grass-stems and plant fibres, placed in bush or small tree up to 5 m above ground, height apparently depending on abundance of *Miscanthus* grass; mean territory size 0.6 ha. Clutch 2–4 eggs (average 2.5), pale milky blue or green, marked all over with brown blotches and long twisted lines, and with greyish-purple underblotches; incubation by both sexes, only female at night, period 16 days; chicks brooded by both parents for 8 days, also fed by both, nestling period 12 days.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Taiwan EBA. Frequent to very common throughout elevational range. In Yushan National Park, recorded densities of 1.83 birds/ha in mixed coniferous forest and 2.18/ha in spruce forest, although these not preferred habitats. Apparently a pest in cultivated millet (*Pennisetum glaucum*), potato, peach and orange crops.

**Bibliography.** Cheng Tsohsin (1987), Collar *et al.* (2003), Ding Tzungsu *et al.* (1997), Hachisuka & Udagawa (1950, 1951), Kirchhofer (1986, 1994), Koh Chaonien & Lee Peifen (2003), Luo Liuchi (1987), Mays *et al.* (2006), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Smith & Yu Hontsen (1992), Stattersfield *et al.* (1998), Yen Chungwei (1990).

## Genus *CHRYSOMINLA* Wolters, 1980

### 269. Bar-throated Minla

#### *Chrysominla strigula*

**French:** Minla à gorge striée **German:** Bändersiva **Spanish:** Minla Colicastaña  
**Other common names:** Bar-throated Siva, Chestnut-tailed/Stripe-throated Minla

**Taxonomy.** [*Mesia*] *Siva strigula* Hodgson, 1837, Nepal.

Commonly placed in genus *Minla*. Proposed races *victoriae* (from Mt Victoria, in W Myanmar) and *cinereigenae* (Meghalaya E to SW Nagaland, in NE India) synonymized with *yunnanensis*. Six subspecies recognized.

**Subspecies and Distribution.**

*C. s. simlaensis* (R. Meinertzhagen, 1926) – N India (W Himachal Pradesh) E to W Nepal.

*C. s. strigula* (Hodgson, 1837) – WC Nepal E to Bhutan and NE India (W Arunachal Pradesh) and adjacent S China (S Xizang).

*C. s. yunnanensis* (Rothschild, 1921) – NE Indian hill states, adjacent S China (SE Xizang, Yunnan and SW Sichuan), N, NE & W Myanmar, N & C Laos and N Vietnam (Tonkin).

*C. s. castanicauda* (Hume, 1877) – SE Myanmar (including N Tenasserim) and NW & W Thailand.

*C. s. malayana* (E. J. O. Hartert, 1902) – Peninsular Malaysia.

*C. s. traili* (J. C. Eames, 2002) – C Vietnam.



**Descriptive notes.** 16–18.5 cm; 14–24 g. Small grey to yellow babbler with ragged yellowish-rufous crown, barred throat, colourful wings and chestnut-edged black tail. Nominative race has loose-feathered crown yellowish-rufous, upperparts olive-grey; black primary coverts, contrasting orange-yellow and black flight-feather fringes and broadly whitish-bordered tertials; tail dull brownish-chestnut and black, with broad whitish outer tips and yellow fringe; short narrow dusky supercilium, blackish-tinged yellow lores and ear-coverts, black submoustachial stripe extending under ear-coverts; chin yellow, throat whitish with wavy black bars, underparts pale yellowish; iris brown to bright red; bill greyish-brown to black, paler below; legs brownish-grey to bluish-grey. Sexes similar. Juvenile is greyer above than adult, more washed out below, with narrower and more broken throat bars. Race *simlaensis* has chestnut on tail confined to basal half; *yunnanensis* is more slaty olive above, yellower on crown and belly, chestnut of tail darker and extending much closer to tip; *castanicauda* is like previous, but blacker ear-coverts, much paler, more washed-out chestnut on tail; *malayana* has more slate-grey ear-coverts, greyish-olive wash on breast and flanks; *traili* has mostly whitish lores, cheek and upper ear-coverts, brighter crown and greyer upperparts. Voice. Sings with high-pitched, slightly quavering "tui-tui-tu", "tui ti-u" or "tui-tui-tui-tui", with higher third note, repeated every few seconds; songs described also as sweet, clear, rising, deliberately paced "syuwéet-suéet-séet" (first part downslurred and then upslurred, second part less slurred, final note highest and unslurred), and a sweet, lisping, falling "p'séet-páséet-pásuú" (notes steeply downslurred, last slightly longer and lowest). Calls include sharp "kip" and softer, nasal "yeeep" notes, weak fussing notes, then upward buzz and louder trilling buzz, e.g. "chipitchip-dzwipitidjéééééééééé" (end note strongly downslurred, with jeering quality) given intermittently with song phrases.

**Habitat.** Broadleaf evergreen forest (especially oak), mixed broadleaf-conifer forest, subalpine oak and rhododendron forest, sometimes pine forest, mixed pine-rhododendron; open forest of birch (*Betula*), willow (*Salix*), barberry (*Berberis*), bushes in forest, oak and rhododendron scrub or other low bushes, bamboo. At 1800–3750 m (1600–3000 m in SE Asia); locally as low as 1300 m during harsh winters in Indian Subcontinent; in Bhutan 2000–3400 m in summer in cool broadleaf, fir and hemlock forests, 1800–3200 m in winter in cool broadleaf forest and adjacent scrub-forest.

**Food and Feeding.** Beetles (Coleoptera), caterpillars and other insects; also berries and seeds, including those of the small myrtaceous tree *Baeckia frutescens*; also nectar from rhododendron flowers. Almost exclusively insectivorous in summer. Arboreal, feeding in tree-tops as well as low herbage; takes insects from rhododendron flowers. Outside breeding season in parties of 6–20 individuals; often joins bird waves, which frequently include other babblers such as *Minla ignotincta* and yuhinas.

**Breeding.** Mar–Aug. Nest a neat cup made of grass, bamboo leaves, moss, black fibrous and other roots, birch bark, pieces of bamboo strippings and thread-like *Usnea* lichen, lined with hair, rootlets, pine needles and fern stalks, placed 1.5–3 m above ground in bush or small tree. Clutch 2–4 eggs (usually 3 in India), bright pale blue, deep blue or blue-green to turquoise, lightly spotted or freckled with black or pale red or brown. No other information.

**Movements.** Resident; some local, rather slight seasonal altitudinal displacements. Claimed status as winter immigrant into Nagaland (NE India) requires substantiation.

**Status and Conservation.** Not globally threatened. Common in Nepal, including Langtang National Park. Common in temperate zone in Bhutan, and present in Thrumshingla National Park. Fairly common in W part of Indian range, common in E; uncommon in Dehra Dun valley and present in Nanda Devi Biosphere Reserve (both in Uttaranchal), present in Buxa Tiger Reserve (West Bengal) and present in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Abundant in Natmantaung (Mt Victoria) National Park, in Myanmar. Common in China. Generally locally common to common in SE Asian range. In Laos, very common above 1800 m on Phou Laoko, in Nakai-Nam Theun National Biodiversity Conservation Area. Present in Vu Quang Nature Reserve, in Vietnam.

**Bibliography.** Ali & Ripley (1948, 1971), Ali *et al.* (1996), Allen *et al.* (1997), Bingham (1903), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Choudhury (2001, 2003), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Eames (2002), Eames *et al.* (2001), Evans & Timmins (1998), Gaston *et al.* (1994), Greenway (1933), Hume & Davidson (1878), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Katti *et al.* (1992), King *et al.* (2001), Lekagul & Round (1991), Ludlow (1951), Ludlow & Kinnear (1937, 1944), Mariens & Lee (1995), Medway & Wells (1970, 1976), Meyer de Schauensee

whitish fringing on wings and tail. Juvenile is like female, but mantle slightly darker and white plumage parts duller, with faint dark scales below. *Race mariae* is olive-brownish (instead of maroon-brown) above, brighter yellow below; *jerdoni* has underparts weaker yellow, more grey-tinted; *sini* is greyer above, more heavily streaked greyish on flanks, bill longer. Voice. Song a fairly high-pitched, loudish, quite quickly repeated (every few seconds) "wi ti wi-wu" (first 2 notes higher); or strident, hurried, slurred, falling "si-swée-swéeéúúú" (first note highest, last prolonged and downslurred). Calls with subdued harsh "wih-wih-wih-wih...", louder, harsher "yih-yih-yih-yih", short "wit" and "wih" notes, and hurried "witti-wi-wrrh".

**Food and Feeding.** Chiefly insects and their larvae; also seeds. Usually found in parties, sometimes of considerable size; often joins bird waves, which may contain other habbblers, such as *Chrysomitris strigula* and yuhinas. Methodically searches branches and trunks, in manner of a treecreeper (*Certhia*), inspecting moss and lichen. Hops along horizontal branches, bending from side to side to inspect undersurfaces.

**Movements.** Resident; seasonal altitudinal displacements described for Bhutan.

**Status and Conservation.** Not globally threatened. Frequent in W of range in Nepal, becoming fairly common in E; common in Langtang National Park. Common in temperate zone and foothills in Bhutan, but relatively scarce in W valleys; present in Thrumshingla National Park. Locally fairly common in India, where present in Buxa Tiger Reserve (West Bengal) and in Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (all Arunachal Pradesh). Formerly resident in Bangladesh, but no recent records. Common in Natmataung National Park, in Myanmar. Common in S China, but recently recorded only in Maershan and Cenwangaolaan Nature Reserves, in Guangxi, and not found at 52 other sites surveyed. Generally common in most of SE Asian range. Common in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. Common in Fan Si Pan National Park and present in Pu Mat and Vu Quang Nature Reserves, in Vietnam.

**Bibliography.** Ali & Ripley (1971), Ali *et al.* (1996), Allen *et al.* (1997), Bangs & Van Tyne (1931), Betts (1956), Birand & Pawar (2004), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paoli (1960), Cheng Tsohsin *et al.* (1963), Choudhury (2003), Davidson (1998), Delacour & Jabouille (1931a), Dowell *et al.* (1997), Farnes *et al.* (2001), Evans & Timmins (1998), Gaston (1989), Grimmer *et al.* (1998), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskip & Inskip (1991, 1993b), Inskip *et al.* (2000), Katti *et al.* (1992), King (1989b), King & Han Lianxian (1991), King *et al.* (2001), La Touche (1923), Lee Kwok Shing *et al.* (2006), Lewthwaite (1996), Ludlow (1951), Ludlow & Kinnear (1937), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1986, 2000), Rothschild (1926, 1960), Rowder (1999), Showler, Davidson, Chanthavi Vongkhamheng & Khounme Salivong (1998), Singh (1995), Smith *et al.* (1940, 1942), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1914, 1923), Stresemann (1923c), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thet Zaw Naing (2003), Tordoff, Lei Man Hing *et al.* (2002), Tordoff, I & Trng Dat *et al.* (2001), Vogel *et al.* (2003), Wang Zhijun & Wei Tianhao (1983), Wu Zhikang *et al.* (1986), Yen Kwokyueng (1934a), Zheng Zuoxin *et al.* (1983).

of feathers; submoustachial and malar areas white, chin and throat yellowish-white, becoming pale yellow with vague long greyish streaks on underparts; iris pale yellow to cream, sometimes brown; bill blackish-brown, paler horn on lower mandible; legs olive-brown to yellowish-horn. Female has dorsal maroon-brown replaced by dull greyish-brown to olive-brown, paler pinkish-yellow to







PLATE 20

inches 4  
cm 10

# Genus *SIVA* Hodgson, 1837

## 271. Blue-winged Siva

### *Siva cyanouroptera*

**French:** Siva à ailes bleues **German:** Blauflügel-siva **Spanish:** Siva Aliazul  
**Other common names:** Blue-winged Minla

**Taxonomy.** *Siva cyanouroptera* Hodgson, 1837, Nepal. Often placed in genus *Minla*, but markedly different vocally from latter and no evidence for a close relationship. Probably fairly close to *Mesia* and *Leiothrix*. Race *orientalis* fairly distinctive; taxonomic status requires further evaluation. Proposed race *croizati* (from Sichuan, in SC China) treated as a synonym of *wingatei*. Seven subspecies recognized.

#### Subspecies and Distribution.

*S. c. cyanouroptera* Hodgson, 1837 – E Uttaranchal Pradesh E to Bhutan, all NE Indian hill states and NW Myanmar.

*S. c. aglae* Deignan, 1942 – NE India (Mizoram) and W Myanmar (Chin Hills).

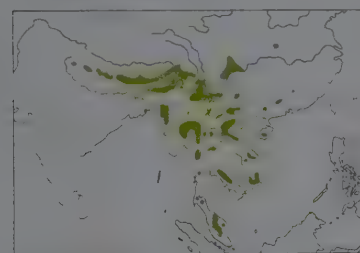
*S. c. wingatei* Ogilvie-Grant, 1900 – NE Myanmar, N Thailand, Laos, Vietnam (S to C Annam), S China (discontinuously NE, C & S Sichuan S to Yunnan, and SW Guizhou, Guangxi, S Hunan and Hainan).

*S. c. sordida* Hume, 1877 – SE Myanmar (including Tenasserim) and NW & W Thailand.

*S. c. sordidior* Sharpe, 1888 – S Thailand and Peninsular Malaysia.

*S. c. rufodorialis* Engelbach, 1946 – SE Thailand and SW Cambodia.

*S. c. orientalis* Robinson & Kloss, 1919 – S Vietnam (S Annam) and adjacent E Cambodia (Phumi Dak Dam, in S Monduliri).



**Descriptive notes.** 14–15.5 cm; 14–28 g. Rather small, slim, pale brownish babbler with longish tail, most races with bluish-black crown streaks and blue wing edges and tail. Male nominate race has crown to upper mantle soft pale grey, crown with long parallel blue-fringed blackish streaks, lower mantle, back, greater upperwing-coverts and scapulars to rump creamy buff-brown, primary coverts black with cobalt-blue fringes, edges of primaries cobalt-blue, tertials black with narrow white tips, tail black with narrow white fringes and cobalt-blue edges; face (lores, supercilium, cheek, ear-coverts) pale whitish-grey.

throat and underparts pale pinkish-grey with whiter belly and vent, lower flanks tinged buff; iris grey, greyish-brown, or dark hazel to whitish or yellowish-grey; bill yellowish-flesh to chrome-yellow, culmen brownish to dark horn; legs brownish to greyish-olive or fleshy white. Female is very similar to male, but has slightly less blue crown and paler mantle. Juvenile has browner, less streaked crown than adult. Race *aglae* has (sex for sex) slightly heavier-streaked crown than nominate; *wingatei* differs from previous in lacking white tips (trailing edges) on scapulars and tail; *sordida* has much-reduced crown streaks, duller upperparts and whiter underparts; *rufodorialis* has chestnut-brown crown and nape, crown with vague grey streaks, chestnut mantle and back and rufous upperpart-coverts, also richer blue on wings and tail; *sordidior* has browner crown and upperparts than other races, blue of wing darker, more violet, blue of tail reduced to vague tinge on outer fringes, whiter below; *orientalis* is larger than others, plumage as last but with paler grey-brown crown, greyer upperparts, and duller, almost entirely washed-out blue in wing, with whiter fringing on secondaries. Voice. Song a rather quickly repeated, very thin, high-pitched “psii si-suuu” or “sée-si-syáúú”, first 2 notes short and high (sometimes one or both are lacking), third greatly stressed and strongly downslurred (*aglae*): a rising and falling “tsuit-two” or “seet-siyúú”, first note longer and more upturned than in previous song type, last shorter but more strongly slurred, and a “suwéet-suwéé”, both notes strongly slurred (both *sordida*). Songs repeated every few seconds. Calls include irregular, short, dry staccato buzzes, and short “whit” and “bwik” contact notes.

**Habitat.** More open broadleaf evergreen, pine and mixed forests, forest edge, secondary growth, bamboo, cultivation near forest. In C Laos common also in *Fokienia*-dominated forest. Occurs at 250–3000 m, mainly c. 800–2600 m; in Bhutan 1600–2400 m, occasionally to 3000 m, some apparently descending as low as 200 m during harsh winter conditions.

**Food and Feeding.** Insects, berries and seeds. Usually found in parties of 5–20 individuals outside breeding season, and a frequent and conspicuous component of bird waves, which may include other babblers, such as minlas, cutias and sibias; in Assam (NE India), seen singly in association with mixed flocks. Forages in canopy, as well as in denser middle-storey growth, bushes and saplings, particularly along forest edge. Also comes closer to ground, especially when seeking certain fruits.

**Breeding.** Mar–Aug across range. Co-operative nest-building, involving three birds, noted in Peninsular Malaysia. Nest a fairly small cup, made of bamboo or other leaves, grass, rootlets, moss, tendrils and creeper stems (exterior often plastered with moss, cobweb and wool), lined with rootlets, fine grasses and sometimes hair, placed within 2 m of ground (usually below 1 m) in bush or streambank, occasionally up to 8 m above ground in tree (where may be suspended from fork or at extremity of branch). Clutch 2–5 eggs (3–4 in Indian Subcontinent, 2–4 in Myanmar), deep blue or bluish-white with a few small black or rusty-brown and violet spots; incubation period 14 days; nesting period in captivity 16 days.

**Movements.** Resident, perhaps with some local seasonal altitudinal displacements; in Bhutan reported descent occurs by Nov, ascent by mid-Apr. in NE India, described as regular winter migrant in Nameri National Park, in Assam, and winter immigrant in Nagaland.

**Status and Conservation.** Not globally threatened. Common in Nepal. Widespread in Bhutan, becoming steadily commoner farther E: near Zhengang, density of 1.2 territories/km of road at 1600–1900 m; present in Thrumshingla National Park. Common in India, where present in Buxa Tiger Reserve (West Bengal), in Nameri National Park (Assam), and in and/or near Eaglenest Wildlife Sanctuary (Arunachal Pradesh). Formerly resident in Bangladesh, but no recent records. Common in Natmataung National Park, in Myanmar. Common in S China, where recently re-

corded in six (11%) of 54 sites surveyed. Locally common in Hong Kong, where population of captive origin. Generally common in SE Asian range. In Laos, common in Dong Hua Sao National Biodiversity Conservation Area (NBCA) and, above 1400 m, in Nakai-Nam Theun NBCA. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam, and in Pu Mat and Vu Quang Nature Reserves in the Annamese Lowlands Endemic Bird Area.

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# Genus *MESIA* Hodgson, 1837

## 272. Silver-eared Mesia

### *Mesia argenteauris*

**French:** Léiothrix à joues argent **German:** Silberohr-Sonnenvogel **Spanish:** Leiothrix Cariblanco  
**Other common names:** Silver-eared Leiothrix, Silver-ear

**Taxonomy.** [*Mesia*] *Mesia argenteauris* Hodgson, 1837, Nepal.

Probably fairly close to *Siva* and *Leiothrix*. Commonly placed in latter genus. Geographical variation considerable, and extremes of range very distinct: further study of species limits perhaps required. Races *vernayi* (NW Assam, N Myanmar and W Yunnan) and *aureigularis* (S Assam, W Myanmar) provisionally included in nominate. Seven subspecies recognized.

#### Subspecies and Distribution.

*M. a. argenteauris* Hodgson, 1837 – E Uttaranchal Pradesh E to Bhutan, NE Indian hill states, N & W Myanmar and adjacent S China (SE Xizang, W & NW Yunnan).

*M. a. galbana* Mayr & Greenway, 1938 – E & SE Myanmar (including Tenasserim) and N & W Thailand.

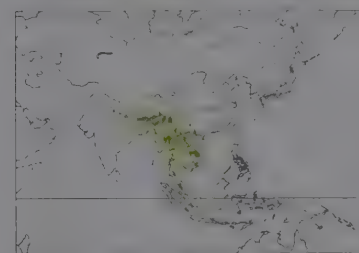
*M. a. ricketti* La Touche, 1923 – S China (S & SE Yunnan, S Guizhou, SW Guangxi), N & C Laos and N Vietnam (Tonkin and N Annam).

*M. a. cunhaci* Robinson & Kloss, 1919 – S Laos, Vietnam (C & S Annam) and adjacent E Cambodia.

*M. a. tahanensis* Yen Kwokying, 1934 – S Thailand and Peninsular Malaysia.

*M. a. rookmakeri* Junge, 1948 – N Sumatra.

*M. a. laurinae* (Salvadori, 1879) – Sumatra (except N).



**Descriptive notes.** 15.5–17 cm; 22–29 g. Smallish babbler in bright, neat colours, black on head with glistening silver ear-coverts, yellow breast, and red wing patch and tail base. Male nominate race has clear-cut jet-black crown to lores, forehead and upper submoustachial area, with orange-yellow patch on forehead above bill base, broadly fanned glistening silvery ear-coverts, dull orange-grey nuchal collar joining (around neck side) with bright yellow-orange chin to breast, and shading to grey on upperparts; upperwing with reddish patch at base of flight-feathers, latter fringed orange-yellow; black tail with narrow yellow

margins on outer webs, orange-reddish upperpart-coverts; duller yellowish-olive lower underparts; iris brown to crimson; bill orange-yellow; legs yellowish-flesh. Female has duller, paler forehead patch, throat and breast, dull golden-olive nuchal collar and upperpart-coverts, less yellow central underparts, pale yellowish-rufous underpart-coverts, paler and duller reddish wing patch and yellow wing fringing. Juvenile is like respective adult, but black of head duller, rest of body colours more washed out. Race *galbana* has greener upperparts than nominate, paler nuchal collar and underparts; *ricketti* has orange-red throat and upper breast, slightly darker underparts; *cunhaci* has much larger yellow forehead patch; *tahanensis* has peachier-toned breast and throat, whiter lower underparts with greyer flanks, slightly paler reddish wing patch; *laurinae* has, with orange-red tinge on forehead patch, orange-red chin to breast and neck side, dull reddish nuchal collar, with pale yellow iris, dark orange bill, orange legs; *rookmakeri* is like last but greener overall, with sharper demarcation between red nuchal collar and mantle. Voice. Song a repeated, cheerful, loud, clearly spaced, descending “che tchu-tchu che-rit” or “che chu chivi chwi”; described also as “tiwéet, tiwééet-tiréet-tiréet-tiwéééer” (most notes with upslurred end, and tightly constructed, with distinct breaks between them). Calls include flat piping “pe-pe-pe-pe-pe” (sometimes used to accompany song, perhaps by female) and harsh chattering notes.

**Habitat.** Bushes, undergrowth, lower and middle storeys in more open broadleaf evergreen, pine and mixed forests, forest edge, secondary growth, scrub, abandoned cultivation, tea plantations,

On following pages: 273. Red-billed Leiothrix (*Leiothrix lutea*); 274. Grey-crowned Crocias (*Crocias langbianis*); 275. Spotted Crocias (*Crocias albonotatus*); 276. Long-tailed Sibia (*Heterophasia picaoides*); 277. Rufous Sibia (*Malacias capistratus*); 278. Grey Sibia (*Malacias gracilis*); 279. Black-headed Sibia (*Malacias desgodinsi*); 280. Dark-backed Sibia (*Malacias melanoleucus*); 281. White-eared Sibia (*Malacias auricularis*); 282. Beautiful Sibia (*Malacias pulchellus*); 283. Rufous-backed Sibia (*Leioptila annectens*).



bamboo, sometimes other grassland; in Bhutan, key feature of habitat is natural openings in more extensive areas of intact forest that avoids degraded areas or extensive edge habitat. Occurs at 175–2100 m (probably mainly above c. 600 m); in Bhutan 600–1800 m, occasionally down to 300 m, and once at 2600 m.

**Food and Feeding.** Insects and their larvae, including ants (Formicidae); also berries, fruits and seeds, including those of cultivated maize (*Zea*). In Hong Kong study, in Aug–May, 87% of 30 faecal samples contained insects and 97% fruit (at least 14 plant taxa utilized). After breeding season forms parties of 5–30 or more individuals, often associating with bird waves (even during breeding season), which typically include other babblers. Usually keeps to bushes in more open forest, but sometimes ascends quite high, 4–5 m, in canopy. Occasionally makes flycatching sallies after escaping insects.

**Breeding.** Nov–Aug (from Apr in N areas); song in Bhutan Apr–Aug, with peak late Apr. Nest, built by both sexes over c. 4 days, a deep, substantial cup made of dead bamboo or other leaves, grass, moss, bracken and roots (including those of epiphytic plants), lined with rootlets or fern/palm fibres, placed from just above ground to up to 2 m above it in bush, slung from fine stems of small vines among branches of bushes or in bracken; said to be indistinguishable in size, structure and situation from that of *Leiothrix lutea*. Clutch 2–5 eggs (usually 4 in India, 2–3 in Peninsular Malaysia), white, lightly spotted with rich madder-brown (or identical to those of *Leiothrix lutea*); incubation, by both parents (female at night in captivity), from first egg, period 13–14 days; nestlings provisioned by both parents; in captivity, nestling period c. 12 days and post-fledging dependence c. 22 days.

**Movements.** Resident. Reported status as common winter visitor in Nameri National Park, in Assam (India), implies seasonal elevational movements, but substantiation required.

**Status and Conservation.** Not globally threatened. CITES II. Generally common in suitable habitat. Local in Nepal, rare in W to frequent in E. In Bhutan common but rather scattered throughout foothills and C & E valleys; near Zhenggang, density of 2.1 territories/km of road at 1600 m; present in Thrumshingla National Park. Formerly resident in Bangladesh, but no recent records. In India, fairly common E from Sikkim, rare in Dehra Dun valley (Uttaranchal); present in Buxa Tiger Reserve (West Bengal), where 15.9 birds/km<sup>2</sup> in semi-evergreen forest; present in (at least) Nameri National Park (Assam), and in Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (all Arunachal Pradesh). Common in China, although uncommon in Shiwandashan National Nature Reserve (Guangxi). Locally common in Hong Kong, where population of captive origin. Common in SE Asian range. In Laos, common in Dong Hua Sao National Biodiversity Conservation Area (NBCA) and in parts of Nakai-Nam Theun NBCA, and present in Phou Dendin NBCA. In Vietnam, common in Tam Dao National Park and present in Ba Be National Park and Na Hang Nature Reserve, and in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam; also in Pu Mat Nature Reserve. Present in Gunung Leuser National Park, in Sumatra.

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## Genus *LEIOTHRIX* Swainson, 1832

### 273. Red-billed Leiothrix

#### *Leiothrix lutea*

**French:** Léiothrix jaune **German:** Sonnenvogel **Spanish:** Leiothrix Piquirrojo  
**Other common names:** Pekin/Peking Robin; Doubtful Leiothrix ("*L. astleyi*")

**Taxonomy.** *Sylvia (lutea)* Scopoli, 1786, mountains of Anhui, China.

Probably fairly close to *Siva* and *Mesia*. Form described as "*L. astleyi*", known only from a pair of live individuals shipped from S China, is considered to represent a mutation of present species caused by long period in captivity. Birds from S Assam hills (India) named as race *luteola*, but *luteola* from *calipyga*. Five subspecies recognised.

#### **Subspecies and Distribution.**

*L. l. kumaensis* Whistler, 1943 – NW Himalayas from NE Pakistan E to N India (Uttaranchal Pradesh) India.

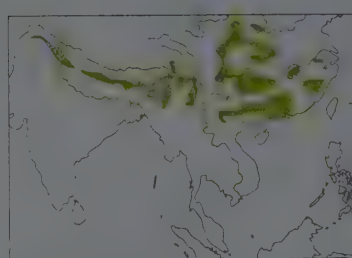
*L. l. calipyga* (Hodgson, 1837) – Nepal E to Bhutan, NE Indian hill states, S China (SE Xizang), and extreme NW Myanmar (S to N Chin Hills).

*L. l. yunnanensis* Rothschild, 1921 – NE Myanmar and S China (W & NW Yunnan).

*L. l. lutea* (Scopoli, 1786) – SC & E China (S Gansu and S Shaanxi E to W Hubei, S Anhui, N Zhejiang and N Fujian, S to C & S Sichuan, Guizhou and N Guangxi).

*L. l. kwangtungensis* Stresemann, 1923 – S & SE China (SE Yunnan E to C Guangxi, S Hunan and Guangdong) and extreme N Vietnam (N Tonkin).

**Descriptive notes.** 14–15 cm; 18–28 g. Small olive-grey babbler with forked tail, red bill, yellow throat, orange-yellow breast, and red to yellow wing markings. Male nominate race has yellowish-buff crown, shading to buff on nape to mouse-grey upperparts, with very long, whitish-tipped uppertail-coverts; upperwing with yellow and orange-yellow fringing and large chestnut-red basal patch on primaries. Small yellow patch at base of outer secondaries, tail glossy black, yellowish-buff lores and orbital area, pale buffish-grey ear-coverts; olive to blackish-olive submoustachial



stripe turning grey under ear-coverts and on neck sides, strong yellow on chin and throat shading to orange-rufous on upper breast, pale yellow mid-breast to vent, pale olive-grey flanks; iris dark brown to crimson; bill coral-red, black base; legs greenish-yellow to pale brown. Female is slightly smaller than male, with more greenish-olive crown, greyer ear-coverts, duller and smaller reddish wing patch. Juvenile is similar to female, but has paler bill, crown concolorous with mantle, with underparts olive-grey and whitish in centre. Race *kwangtungensis* is like nominate, but with yellow-tinged crown to nape, more olive-toned posterior upperparts, yellowish face, neck side and underparts, orange patch at base of secondaries; *kumaensis* has greener crown with more restricted yellowish wash than nominate, little or no chestnut-red wing patch but orange-red distal outer fringes of inner primaries, patch at base of secondaries orange; *calipyga* is similar to previous but yellowish above, orange-red fringes of inner primaries extending entire length of feathers; *yunnanensis* is similar to *kumaensis* above, but lores and orbital area whitish, chin to breast paler, wing with no red or orange colouring. **Voice.** Song long and complex, a rather rapid, fluty warble of up to 15 notes, variable in structure, to European ears recalling Blackcap (*Sylvia atricapilla*); second song type shorter, with fixed sequence of syllables; third type quieter and less melodic, given by male in pursuit of female. Calls include guttural, slightly nasal short abrupt "zhirk" or "shreep" notes, sometimes run together as rattling chatter, "zhri-zhri-zhri..." in aggression towards human or avian intruders (including conspecifics); also shorter, harder "zip" calls and, in alarm, dry, grating buzzy "zhriti-zhriti-zhriti..." rattles.

**Habitat.** Thick undergrowth in more open broadleaf evergreen, pine and mixed forests, forest edge, secondary growth, scrub including shrub verbena (*Lantana camara*), also abandoned cultivation, tea plantations, bamboo clumps. Feral population in Japan favours *Tsuga* and *Abies* forests and deciduous broadleaf forest with dense undergrowth dominated by bamboo; feral population in Hawaii uses both native and exotic wet forests wherever good shrub layer present (thus absent from exotic *Casuarina* and *Eucalyptus* plantations), and abundance correlated with elevation, tree biomass and abundance of fruit-bearing native and introduced shrubs. Found throughout range at 75–3400 m, mostly 900–2400 m, all year. In Bhutan summer range said to span 1800–3200 m (sometimes 3400 m), in cool broadleaf and conifer forest, including blue pine and fir forest, whereas winter records at 1000–2800 m, occasionally down to 600 m, in warm broadleaf forest.

**Food and Feeding.** Insects; also berries and seeds, including those of grass and *Rhus*. In Hong Kong study, Aug–May, 58% of 55 faecal samples contained insects and 96% fruit (at least 22 plant taxa exploited). Introduced birds in Japan found to consume seeds of at least ten species of plant, with predominance of *Ilex macropoda* and *Celastrus orbiculatus*; mean foraging height 4 m off ground, keeping especially to areas with dwarf bamboo. In Hawaii, fruits of native *Rubus* and *Vaccinium* and introduced *Fraxinus*, *Rubus*, *Psidium* and *Carica* popular, and invertebrates in 13 stomachs were lepidopterans (caterpillars, butterflies, moths), Hymenoptera (bees, wasps), flies (Diptera) and snails; spiders (Araneae) and millipedes (Diplopoda) also recorded in faecal samples. In captivity distinct preference for spiders and smooth caterpillars, shunning hard beetles (Coleoptera), legless larvae and very small insects such as aphids (Aphidoidea), and eats ants (Formicidae) only after performing anting movements. In pairs in breeding season, otherwise in small parties of 4–6 individuals, sometimes in association with bird waves; in Bhutan reported in "invariably" monospecific flocks of up to 20 individuals, moving rapidly through undergrowth. Non-breeding flocks in Hawaii have held as many as 100 birds. Forages with rapid movements in low vegetation, mainly below 3 m, and on ground; occasionally ascends trees, gleaning and plucking items, sometimes hanging upside-down, and frequently making short aerial leaps to snatch flying insects. In one study in Hawaii, foliage-gleaning and probing made up 45% of foraging activities, fruit-feeding 41%, bark-gleaning and pecking 11%, flycatching 2%, and flower-probing 1%.

**Breeding.** Apr–Oct generally, and song mid-May to Aug in Bhutan; in Japan (introduced) season extends from late Apr to early Oct; mid-brooded. Nest, built mostly by female (male supplying material), a regular or oval cup, of varying depth and solidity, made of fine and coarse grasses, dead bamboo and other leaves, leaf skeletons, moss, lichen and fine pieces of rattan, lined with fine rootlets, fine grasses, palm and other soft fibres, tendrils and fern stems, placed 0.6–1.5 m (sometimes up to 4.5 m) above ground in bush or bamboo; territoriality unclear, in Hawaii (introduced) mean home ranges measured as 3.07 ha for males and 2.68 ha for females, but extensive overlap between pairs. Clutch 3–5 eggs, normally 3–4 (in introduced Japanese population mean for 147 nests 3.4), pale blue to greenish or greenish-white, rarely white, usually with red-brown or umber-brown blotches, red-brown and purple speckles, and pale lilac streaks and clouds; incubation by both parents, mainly female, period 11.5–14 days; nestlings provisioned by both parents; nestling period in captivity 9–12 days. Fledging success in Japan (introduced population) in three successive years 2000–2002 respectively 22.6%, 14.9% and 45.3%, with nest predation greatest cause of failure. In feral population in Hawaii, 1977–1979, annual survival for 227 adults was 0.786 and for 111 hatch-year birds 0.581 (but no avian predators present).

**Movements.** Resident. Reported seasonal altitudinal displacements in Bhutan and elsewhere in Himalayas (including at Dehra Dun), with movements fairly rapid, occurring in first half Nov and second half Apr. Winter visitor in Islamabad area of Pakistan, including Margalla Hills. In Hawaii, dispersive from breeding areas, flocks sometimes moving to higher elevations.

**Status and Conservation.** Not globally threatened. CITES II. Very scarce, perhaps only vagrant, in Pakistan. Fairly common in Nepal. Common throughout temperate zone in Bhutan, where present in Thrumshingla National Park. In India, uncommon in W Himalayas to locally common in E, hence very rare on New Forest campus at Dehra Dun and rare in Dehra Dun valley (Uttaranchal); present in Eaglenest Wildlife Sanctuary and Namdapha National Park (Arunachal Pradesh). Fairly common in S China, where recorded in 17 (31%) of 54 surveyed sites (of which 52 are nature reserves), but rare in one of them, Diding Nature Reserve, in Guangxi; abundant in mountains of NW Fujian. Uncommon in Hong Kong, where population of captive origin. In Myanmar, scarce in W but common in N; common in N Vietnam. Has been heavily traded: since 1997, when it was listed on CITES Appendix II, total of 227,517 wild-caught individuals has been recorded in international trade. Feral populations have become at least temporarily established, for example: in Hawaii (recently collapsed, but has history of dramatic unexplained population fluctuations on several islands, in mid 1980s c. 98,000 in 3529-km<sup>2</sup> study area on Hawaii, 19,000 in 404-km<sup>2</sup> study area on Maui, and 1800 in 131-km<sup>2</sup> study area on Molokai), in Japan (exploding in range and numbers in past two decades, reaching density of 350–400 pairs/km<sup>2</sup> on Mt Tsukuba, in C Japan); and in Europe (France, Italy and Germany), as well as on Reunion I, in Indian Ocean.

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**Habitat.** Broadleaf evergreen forest, forest edge, secondary growth, oak and pine forest, open scrub with large trees or clearings in forest. In C Laos common in dry evergreen and *Fokienia*-dominated forest. Found at 100–3000 m, reaching highest elevations in Sumatra; apparently mainly above 500 m, and to maximum of 1525 m in Indian Subcontinent, 1800 m in Thailand and Laos; in Bhutan reportedly at 400–1600 m when breeding, and thought mostly to withdraw below 1000 m in winter, but further evidence required.



**Food and Feeding.** Insects, flower buds, fruits, berries and seeds. Regularly takes nectar of the silk-cotton trees *Bombax ceiba* and *Saindhalia* (*Bemisia*) *malabarica*, coral trees (*Erythrina*), cherries (*Prunus*) and other flowers, as well as fig (*Ficus*) fruits, in one area seen to feed on scraps thrown to chickens. Occurs in pairs or in small parties of 4–15 individuals even in breeding season (at least until mid-May). Sometimes in larger parties of up to 30–40, often in association with other species in bird waves. Forages mostly in canopy of larger trees, often where foliage quite thin, and also down to lower branches of trees and taller understory vegetation.

**Breeding.** Feb–Aug. Solitary, but pairs may nest in adjacent trees. Nest, built by both sexes, described as a very deep cup or bag, made mostly of moss with some dead leaves, lined with rootlets and rhizomorphs, placed 6–9 m above ground high up on horizontal branch or suspended from thin twigs of tree (including conifer). Clutch size undocumented, eggs pale grey-green marked with small reddish-brown blotches. No other information.

**Movements.** Resident. Description as common winter visitor in Nameri National Park, in Assam (India), requires substantiation.

**Status and Conservation.** Not globally threatened. Recently (Apr 2006) observed in Royal Chitwan National Park, in Nepal, first confirmed record in country since 19th century. Common throughout foothills and C & E valleys in Bhutan, but presence limited to large areas of continuous forest, notably in Deothang area (Samdrup Jongkha district) and W slope of Mangde Chhu valley, near Zhenbang (in Royal Manas and Jigme Singye Wangchuck National Parks). Locally fairly common in India, where present in Buxa Tiger Reserve (West Bengal) and in Eaglenest Wildlife Sanctuary and Nandapha and Moulting National Parks (all Arunachal Pradesh). Common in China, where present in Dawangling Nature Reserve (Guangxi), with eight individuals seen in one day. Generally locally common in SE Asian range. Common in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. Present in Na Hang Nature Reserve and in Vu Quang Nature Reserve, in Vietnam. Common at Bukit Fraser, in Peninsular Malaysia. Present in Gunung Leuser National Park, in Sumatra.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Anon. (1980a), Barua & Sharma (2005), Bingham (1903), Bingham & Thompson (1900), Birand & Pawar (2004), Buij *et al.* (2006), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Choudhury (2003), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Harrison & Parker (1965), Hill (2000), Inskipp & Inskipp (1991, 1993b), Katti *et al.* (1992), King *et al.* (2001), Lê Manh Hùng *et al.* (2003), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lohrl (1993), Ludlow & Kinnear (1944), Madoc (1956), van Marle & Voous (1988), Mayr (1938), Medway & Wells (1939, 1960), Meyer de Schauensee (1934, 1946, 1984), O'Brien & Kinnear (1996), Rasmussen & Anderton (1994), Robinson (1984), Robinson (2000), Shovier, Davidson, Khumdee Saisong & Khumkhoun Khounboline (1998), Smith *et al.* (1940, 1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1914, 1923), Thompson & Johnson (2003), Thompson *et al.* (1993), Tizard *et al.* (1997), Tordoff *et al.* (2002), Vogel *et al.* (2003).

## Genus MALACIAS Cabanis, 1851

### 277. Rufous Sibia

#### *Malacias capistratus*

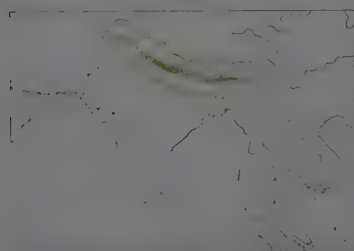
**French:** Sibia casquée **German:** Schwarzappentimalie **Spanish:** Sibia Rufa  
**Other common names:** Black-capped Black-headed Sibia

**Taxonomy.** *Cinlosoma capistratum* Vigors, 1831, Simla, Himachal Pradesh, India. Genus usually merged with *Heterophasia*. May form a superspecies with *M. gracilis*. Three subspecies recognized.

**Subspecies and Distribution.** *M. c. capistratus* (Vigors, 1831) – NE Pakistan (Murree Hills) E in W Himalayas to extreme W Nepal.

*M. c. nigricipes* (Hodgson, 1839) – Nepal (except extreme W & E) and adjacent SW China (S Xizang).

*M. c. hayleyi* (Kinnear, 1939) – E Nepal E to Bhutan and NE India (W Arunachal Pradesh) and S China (Chumbi Valley, in S Xizang).



**Descriptive notes.** 21–24 cm; 28–47 g. Slender buffy-rufous babbler with black head, blue-grey in wings and tail, slender decurved bill. Nominate race has crown and head side (lores, ear-coverts, submoustachial area) black with slightly elongate feathers, forehead with greyish tinge, clear-cutting to continuous buffy-rufous nuchal collar, neck side and underparts, and shading to soft pale brown-tinged grey on lower mantle, back and scapulars, and to slightly richer rufous on rump and uppertail-coverts; tail broadly tipped grey, central feathers pale dull rufous with broad blackish subterminal tips, outer feathers mainly blackish.

greater upperwing-coverts blue-grey with white transverse band, primary coverts black, flight-feathers with bluish-white and blue-grey fringes, tertials dull rufous with blue-grey tips; iris reddish-brown; bill black; legs brownish-flesh. Sexes similar. Juvenile has crown and head sides brownish-black, upperparts brim rufous, paler rufous below, red-tipped and buff-tinged white on greater coverts. Race *nigricipes* has all-black crown, brighter brownish-rufous underparts, more brownish-grey upperparts, more rufous-chestnut rump and warmer uppertail; *hayleyi* is like previous but has colder, darker upperparts, browner tertials, brown iris. Voice. Song, heard all year but mostly Apr–Aug, a clear high-pitched, silvery, slightly descending, quickly whistled “ss-u-u-u-u” or “ss-dwi-dwi-dwi” (first note less clear) repeated every 6–10 seconds; described also as “swee-swee-swee-sweet” (first part sometimes more hurried), and similar but only slightly descending “sissuu-sissuu-sissuu”. Calls include familiar grating, rattling “twit-ti”, “trrit-tit-tit” and “kjit-jit-jit-jit”, single “twit” and “titi” notes, jarring “jhit-jhit-jhit-jhit...”, and thin “trr-trr” and “trrit-tri”; alarm a harsh “chrai-chrai-chrai”.

**Habitat.** Broadleaf evergreen forest, particularly oak; also mixed broadleaf–coniferous forest (oak, fir and chestnut, etc.), secondary growth, scrub, locally deciduous forest, borders of cultivation, gardens. Found at 1200–3410 m (below 2700 m in W, mainly 2000–3000 m in E), locally down to c. 800 m, some as low as 100 m during harsh winter conditions. In Bhutan summer range 1600–

3000 m, occasionally to 3200 m, largely coinciding with extent of oak; in winter keeps within this range but relatively small numbers descend to 800 m or even 200 m.

**Food and Feeding.** Insects and berries. Visits rhododendron and silk-cotton tree (*Bombax ceiba*) flowers in search of insects and nectar, pair in captivity caught many wild wasps (Hymenoptera) drawn into cage by aphids (Aphidoidea) under bamboo and by jam, feeding wasps to young after despoiling them; other captives noted for frequent flycatching, however small the prey. Found in small monospecific parties up to 20 individuals outside breeding season, occasionally joins mixed feeding flocks, which may contain other babblers. Arboreal, hunting in canopy and among moss-laden and lichen-covered trunks and thick understory foliage, occasionally descending to undergrowth.

**Breeding.** Apr–Aug. Nest, built by both sexes, a neat cup of green moss, dry grasses and dry leaves, firmly interwoven and lined with rootlets, pine needles or other fine material, placed 2–18 m (usually 7–8 m) above ground in tree or bush, often near extremity of branch. Clutch 2–3 eggs (usually 3 in India), pale bluish-grey, clouded, spotted and lined with various shades of brown; incubation reportedly by female alone, but both sexes incubate in captivity, where period 14 days; nestling period in captivity 15–16 days.

**Movements.** Resident; minor altitudinal displacements by small proportion of population in winter. **Status and Conservation.** Not globally threatened. Commonest and most widespread sibia in main Himalayan range. Locally frequent in Pakistan. Common in Nepal. Abundant throughout temperate zone in Bhutan, where probably the commonest forest bird species, at least in areas with good forest cover; near Zhenbang, density of 13 territories/km of road at 1600–1900 m, highest value for any avian species in area; present in Thrumshingla National Park. Common in India, but uncommon in Majhatal Harsang Wildlife Sanctuary (Himachal Pradesh); fairly common in Dehra Dun valley (Uttaranchal) and present in Buxa Tiger Reserve (West Bengal). Status in Xizang (China) unknown.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Baars (1981), Cheng Tsohsin (1987), Dodsworth (1911), Franklin (1973, 1975), Gaston *et al.* (1994), Grimmett *et al.* (1998), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Jarsch (1981), Löffing (1984), Ludlow & Kinnear (1937, 1944), Martens & Eck (1995), Meyer de Schauensee (1984), Mishra (1997), Philipps (1903b), Rasmussen & Anderton (2005), Sankaran (1994), Sheriff (1925), Singh, A.P. (2000), Singh, P. (1995), Spierenburg (2005), Stevens (1923), Zheng Zuoxin, Jiang Zhuhua *et al.* (1980), Zheng Zuoxin, Li Dehao *et al.* (1983).

### 278. Grey Sibia

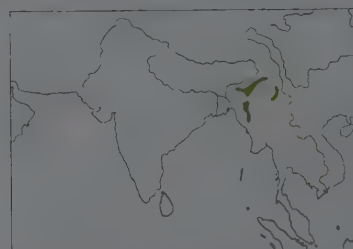
#### *Malacias gracilis*

**French:** Sibia grise **German:** Grautimalie **Spanish:** Sibia Gris

**Taxonomy.** *Hyppispetes gracilis* Horsfield, 1840, Naga Hills, India.

Genus usually merged with *Heterophasia*. May form a superspecies with *M. capistratus*. Birds from Mt Victoria, in W Myanmar, described as race *dorsalis*, but appear inseparable from those elsewhere in species' range. Treated as monotypic.

**Distribution.** NE Indian hill states (S of R Brahmaputra), N & W Myanmar and S China (W Yunnan).



**Descriptive notes.** 22.5–24.5 cm; 34–42 g. Slender, long-tailed brown and grey babbler with white underparts and grey patches in wings and tail. Crown and head side (lores, cheek and ear-coverts) are brownish-black, shading on neck side and upperparts to brown-tinged dark grey, and to pale grey on uppertail-coverts; tail with grey central feathers and broad blackish subterminal band, outer feathers increasingly blackish but with broad grey tips; upperwing black, greater coverts white basally, distal outer edges of outer primaries pale grey, basal fringes of inner primaries glossy blue-black, tertials pale grey with blackish edges; chin and

submoustachial area to underparts white, with pale grey flanks, slight buffy wash across breast and on lower underparts; iris red to brown; bill black; legs dark brown to black. Sexes similar. Juvenile has forecrown and crown duller and browner-tinged than adult, nape to uppertail-coverts and scapulars paler and browner, body paler overall. Voice. Song a repeated, very loud, strident and far-carrying series of well-spaced high-pitched shrill whistled notes (usually descending towards end, or from beginning), e.g. “tu-tu-ti-ti-ti-tu”, “ti-ti-ti-ti-ti-tu”, “ti-ti-ti-ti-tu” and “ti-tu-ti-ti-ti-tu”. Calls with harsh grating, slightly metallic “trrit-trrit”; contact calls include quiet hurried, nasal, rather squeaky “witwit-witarit” and “wit-witarit-warao”, and soft sibilant “ti-tew”.

**Habitat.** Broadleaf evergreen and deciduous forest, including oak and rhododendron forest, sometimes pine and mixed forests, degraded and secondary forest with scattered tall trees; locally deciduous forest. At 900–2800 m.

**Food and Feeding.** Insects, including bees (Hymenoptera); also berries and small fruits, including those of witch-hazel (*Bucklandia*), and seeds. Often visits tree blossoms, including those of silk-cotton trees (*Bombax ceiba*), in search of insects and nectar. Occurs in small parties outside breeding season. Forages in canopy and among moss-covered trunks and epiphytes, occasionally descending to bushes and undergrowth.

**Breeding.** Apr–Aug. Nest, built by both sexes, a deep, firm, neatly woven cup, made of grasses, moss, roots, leaves, fibres and green pine needles, plastered with green moss and cobweb, lined with grasses, grass seed stems, rootlets and rhizomorphs, placed up to 6 m above ground in crown of tree, outer branches of rhododendron or pine tree or top fork of sapling. Clutch 2–4 eggs, usually 2–3, pale bluish-grey to greenish-grey, sometimes pinkish, lightly freckled and blotched pale reddish-brown to dark brown or ash-brown; incubation of eggs and provision of chicks by both sexes; no information on duration of incubation and nesting periods.

**Movements.** Resident. Reports of some seasonal elevational movements require substantiation. **Status and Conservation.** Not globally threatened. Restricted-range species; present in Eastern Himalayas IBA. In India, common in Assam, and recently observed in Nagaland although apparently scarce there; seen in groups of 2–3 individuals in Murlen and Phawngpui (Blue Mountain) National Parks (common in former and frequent in latter), with single record from Lengting Wildlife Sanctuary, in Mizoram. Abundant in Namataung (Mt Victoria) National Park, in Myanmar, and one of the commonest bird species at higher elevations throughout the Chin Hills. Very local in China.

**Bibliography.** Ali & Ripley (1972), Bens (1956), Cheng Tsohsin (1987), Choudhuri (2005, 2006), Godwin-Austen (1870, 1874), Grimmett *et al.* (1998), Hopwood & MacKenzie (1917), Koelz (1954), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952), Robinson (2000), Robinson *et al.* (1998), Singh (1995), Smythies (1986), Stanford & Mayr (1941), Stanford & Treinost (1935, 1940), Stanford *et al.* (1998), Stresemann & Heinrich (1940a), Thet Zaw Nong (2003), Wickham (1929), Wood & Finn (1902).



## 279. Black-headed Sibia

### *Malacias desgodinsi*

**French:** Sibia de Desgodins **German:** Schwarzkopftimalie **Spanish:** Sibia Cabecinegra  
**Other common names:** Black-eared Sibia; White-spectacled Sibia (*robinsoni*)

**Taxonomy.** *Sibia Desgodinsi* Oustalet, 1877, Yer-ka-lo, on the Mekong [Lancang Jiang] at c. 29°03'30" N, Xizang, China.

Genus usually merged with *Heterophasia*. Until recently treated as conspecific with *M. melanoleucus*. Birds from NW Yunnan (particularly Lijiang), in S China, described as a further race, *tecta*, supposedly with more brown on upperparts, but this feature is not constant. Five subspecies recognized.

#### Subspecies and Distribution.

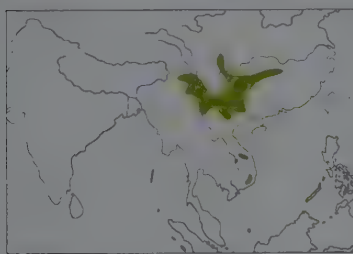
*M. d. desgodinsi* (Oustalet, 1877) – N Myanmar and SC & SE China (Yunnan, C & S Sichuan, W & N Guizhou, NW Hunan, W Guangxi).

*M. d. tonkinensis* (Yen Kwokying, 1934) – extreme N Vietnam (N Tonkin).

*M. d. engelbachi* (Delacour, 1930) – Bolovens Plateau, in S Laos.

*M. d. kingi* (J. C. Eames, 2002) – SE Laos and C Vietnam (C Annam).

*M. d. robinsoni* (Rothschild, 1921) – S Annam, in S Vietnam.



**Descriptive notes.** 21.5–24.5 cm; 35–49 g. Slender long-tailed babbler, grey or brown above with black head, white below, with narrow bill. Nominative race has crown, head side (lores, cheek, submoustachial area, ear-coverts) and nape black, crown with slight bluish gloss, malar line spotted black and white; upperparts pale grey with slight mauve wash, upperwing black with slight bluish gloss on fringes; tail black with bluish gloss on edges, central feathers with grey tips, outer feathers with white tips; chin, throat and underparts pure white, faint mauve-grey wash on breast and flanks, pale grey thighs; iris crimson to brown; bill

black; legs blackish to pale greyish-black. Distinguished from similar *M. melanoleucus* by having crown sharply delineated from distinctly paler mantle, tail tips greyish-white and broad (especially on central feathers), uppermost chin feathering usually white (not black), breast and flanks suffused pale grey. Sexes similar. Juvenile of nominate race apparently undescribed; juvenile *robinsoni* has crown and base colour of ear-coverts duller than adult, slightly brown-tinged upperparts, stronger breast wash. Races differ in size (smaller in S) and in plumage colour and pattern: *tonkinensis* is like nominate, but purer and paler grey above and below; *engelbachi* has white broken eyering, white upper submoustachial area (sometimes mixed with some black), dark brown mantle, scapulars and back; *kingi* has broken white eyering as previous, but upperparts drabber brown; *robinsoni* has plumage as nominate, but with broad broken white eyering, browner ear-coverts narrowly streaked whitish, submoustachial mixed dark brown or blackish and whitish (leucistic individuals of this race also recorded). Voice. Song “hi wi-wi wi wi” or “hi hwi-wi wi-wi”, similar to that of *M. melanoleucus* but slower, more structured and less descending; 6-note song reported from S Laos. Contact calls are thin, repeated “tsrrr” notes.

**Habitat.** Broadleaf evergreen forest, oak and pine forest, and forest edge, at 800–2895; some apparently as low as 350 m during harsh winter conditions in China.

**Food and Feeding.** Insects, grubs, berries and nectar. Arboreal, usually in pairs or small flocks, mostly in treetops; occasionally descends to undergrowth, particularly in search of berries, creeping about in mossy epiphytes in skulking, jerky manner. In captivity, exhibits a liking for wasps (Hymenoptera) and catches much food on the wing.

**Breeding.** Season Apr–Aug in China and Feb–Jun in S Annam. Eggs pale blue, faintly stippled darkish brown to dull mauve with larger blotches and clouds; no other information for wild-living populations. In captivity, one nest described as flimsy, clutch size 1–3 eggs, incubation period 14–16 days and nestling period 15–17 days.

**Movements.** Resident. Only minor altitudinal movements recorded.

**Status and Conservation.** Not assessed. Common in SC & S China, where recently recorded in Cenwangaiaoshan and Diding Nature Reserves, in Guangxi. Generally common in SE Asian range. In Vietnam, uncommon in Fan Si Pan National Park, in Tonkin, and present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam; in last-mentioned area, density estimate of 0.32 birds/ha, yielding population estimate for reserve of 2640 individuals.

**Bibliography.** Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), Cheng Tsohsin *et al.* (1963), Collar (2006), Deignan (1948), Delacour & Jabouille (1931a), Deng Xuejian *et al.* (1995), Dickinson (1970), Dowell *et al.* (1997), Eames (1995, 2002), Engelbach (1932), Hewston (1999), Hill *et al.* (2001), Huang Qiang *et al.* (1995), King *et al.* (2001), King & Han Lianxian (1991), Lê Manh Hùng *et al.* (2002), Lee Kwok Shing *et al.* (2006), Meyer de Schauensee (1984), Riley (1926), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993a, 1993b), Rothschild (1926), Smythies (1949), Stanford (1941), Stanford & Mayr (1941), Stresemann (1923c), Tan Yaokuang & Cheng Tsohsin (1964), Tordoff, Lê Manh Hùng *et al.* (2002), Tordoff, Lê Trong Dat *et al.* (2001), Vogel *et al.* (2003), Wu Zhikang *et al.* (1986).

## 280. Dark-backed Sibia

### *Malacias melanoleucus*

**French:** Sibia à tête noire **German:** Tickeltimalie **Spanish:** Sibia Dorsinegra  
**Other common names:** Black-capped Sibia

**Taxonomy.** *Sibia melanoleuca* Blyth, 1859, Mulayit Taung [16°11' N, 98°32' E], Tenasserim, Myanmar.

Genus usually merged with *Heterophasia*. Until recently treated as conspecific with *M. desgodinsi*. Races *radcliffei* and *castanopterus* intergrade in EC Myanmar (Southern Shan States). Birds in W Thailand of undetermined race, presumed to belong with nominate race of adjacent part of Myanmar. Three subspecies recognized.

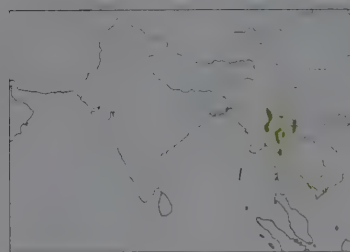
#### Subspecies and Distribution.

*M. m. radcliffei* (Stuart Baker, 1922) – EC & E Myanmar, NW Thailand and NW Laos.

*M. m. castanopterus* Salvadori, 1889 – SE Myanmar.

*M. m. melanoleucus* (Blyth, 1859) – N Tenasserim (S Myanmar) and adjacent W Thailand.

**Descriptive notes.** 21–23 cm; 23–39 g. Slender, narrow-billed long-tailed babbler, dark brown above with black head, white below. Nominative race has crown, head side (lores, cheek, submoustachial area, ear-coverts) and nape black, malar line spotted black and white, nape shading



repeated loud, high-pitched, wavering whistle, dropping in pitch at end, “hrrrr’rrr’r’i-u”, “hrrrr’rrr’r’i-i” and “hrrrr’rrr’r’i”. Calls include quite harsh “trr-trr-trr-trr...” contact notes.

**Habitat.** Broadleaf evergreen forest, at 1000–2565 m.

**Food and Feeding.** Insects, grubs, berries and nectar. Usually in pairs or small flocks. Arboreal, mostly in treetops; occasionally descends to undergrowth, particularly to find berries.

**Breeding.** Feb–Jun. Nest a cup made of moss, pine needles, grasses, leaves and wool, sometimes (when near habitation) decorated with bits of string or paper, lined with pine needles and black hair-like fibres from fungi stalks, placed 2.5–7.5 m above ground and usually on small outer branches of tree or upperside of pine branch. Clutch 1–3 eggs, pale blue or green-blue, well marked with dark or dull pale red; nestlings fed by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Generally common across range. Common in Doi Inthanon National Park, in NW Thailand.

**Bibliography.** Collar (2006), Deignan (1963), Hume & Davison (1878), Lekagul & Round (1991), Livesey (1933), Robson (2000), Smith *et al.* (1940, 1943), Smythies (1986), Tizard *et al.* (1997), Wickham (1929)

## 281. White-eared Sibia

### *Malacias auricularis*

**French:** Sibia de Taiwan **German:** Weißohrtimalie **Spanish:** Sibia de Formosa  
**Other common names:** Taiwan Sibia

**Taxonomy.** *Kittaeincla auricularis* Swinhoe, 1864, Taiwan.

Genus usually merged with *Heterophasia*. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 22–24 cm; mean 48 g. Elegant babbler with black head, wings and tail, protracted white eyestripe, grey and rufous body. Crown is glossy bluish-black, contrasting sharply with prominent white stripe from lores through eye (including eyering) to upper rear ear-coverts, stripe ending in long filamentous plumes; neck side, mantle and upper back dull grey, lower back, rump and uppertail-coverts rufous-chestnut; upperwing glossy bluish-black with narrow whitish wingpanel, tail brownish-black with pale grey to whitish tips; throat maroon-brown becoming paler on breast, belly pinkish-rufous or salmon-buff; iris

brown; bill black; legs brownish-flesh. Sexes similar. Juvenile apparently undescribed. Voice. Song a loud, beautiful, resonant “fei fei fei yo”, “weep-weep-weep-weeeooo” or a pleasant “wii-wiiuu” wolf-whistle. Warning calls include loud, sibilant, slightly tailing-off “sirrrrrrrrr”, repeated frequently but irregularly, often interspersed with short loud hard “sip” notes.

**Habitat.** Broadleaf evergreen forest (particularly oak), mixed broadleaf–coniferous forest, sometimes spruce, fir and cedar forest, forest edge and clearings in forest; also deciduous forest outside breeding season. Found at 1200–3000 m in summer, some descending as low as 700 m, sometimes 200 m, during harsh winter weather conditions; elevational limits in N Taiwan 750–2780 m.

**Food and Feeding.** Nectar and insects, taken from flowers; also acorns (including those of oak genus *Pasania*), berries, fruits (including climbing figs) and seeds. Singly, in pairs or in small parties. Forages in middle to upper storeys, primarily in canopy, but also descends to undergrowth. Very active, and not shy.

**Breeding.** Apr–May. Nest placed in thick foliage in tree canopy. No other information available.

**Movements.** Resident; may wander to lower elevations in winter.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Taiwan EBA. Common. In Yushan National Park, recorded densities of 0.3 birds/ha in mixed coniferous forest and 0.8/ha in spruce forest, although these not preferred habitats. Study undertaken at Endemic Species Research Unit, but details of findings currently unavailable.

**Bibliography.** Cheng Tsohsin (1987), Collar *et al.* (2003), Ding Tzungsu *et al.* (1997), Hachisuka & Udagawa (1950, 1951), Koh Chaonien & Lee Peifen (2003), Meyer de Schauensee (1984), Severinghaus & Blackshaw (1976), Smith & Yu Hontsen (1992), Stattersfield *et al.* (1998), Yen Chungwei (1990).

## 282. Beautiful Sibia

### *Malacias pulchellus*

**French:** Sibia superbe **German:** Blaukopftimalie **Spanish:** Sibia Bonita

**Taxonomy.** *Sibia pulchella* Godwin-Austen, 1874, Barail Range, Assam, India.

Genus usually merged with *Heterophasia*. Recently treated as monotypic, but races appear quite distinct. Two subspecies recognized.

#### Subspecies and Distribution.

*M. p. nigroauritus* (Kinneer, 1944) – NE India (W & C Arunachal Pradesh) and adjacent S China (SE Xizang).

*M. p. pulchellus* (Godwin-Austen, 1874) – NE India (E Arunachal Pradesh S to Nagaland), N Myanmar and S China (W & NW Yunnan).

**Descriptive notes.** 23 cm; 35–50 g. Blue-grey babbler with black face and wing-coverts, dull brown tertials, broad black subterminal tailband. Nominative race has lores, forehead, area around eye and upper submoustachial stripe black, crown grey-blue, shading to blue-grey on neck side





and upperparts; upperwing with greater and primary coverts black, primaries edged pale grey, secondaries fringed grey-blue, tertials dull brown; central tail feathers dull brown with black subterminal band and broad dull grey tip, outer feathers mainly black with broader dull grey tips; chin, throat and underparts pale grey below; iris red-brown to brown; bill black; legs horn-brown to brown. Sexes similar. Juvenile is duller than adult, body tinged brown. Race *nigroauritus* differs from nominate in having clear-cut black cheeks and ear-coverts. Voice. Song a repeated loud strident "ti-ti-ti-tu-ti" (descending slightly to

wards end), described also as fluty, sibilant, gradually descending whistle, louder and more slurred and with "kink" near end, "siii-see-see-suu-suuwée" (last note higher than previous one, but both lower than rest); reminiscent of that of *M. gracilis* but higher-pitched, shriller and generally less descending, with more hurried beginning. Calls with continuous low rattling "chrrrrrrrr" or "churrururr", also very high tittering "tr-tr-tr-tr-tr-tr-rt..." trill that may continue unvaryingly for several seconds.

**Habitat.** Broadleaf evergreen forest at 1650–3000 m, occasionally to 3200 m; locally down to 300 m in NE India and 900 m in Myanmar, presumably during harsh winter weather.

**Food and Feeding.** Insects and their larvae, including beetles (Coleoptera); seeds, including those of viburnums (*Viburnum*) and evergreen magnolias or michelias (*Michelia*), also of knotgrass (*Polygonum*); fruits, including those of certain ginsengs (*Heptapleurum*), wild raspberry (*Rubus*) and witch-hazels (*Rhodoleia*); also other vegetable matter. Regularly visits blossoms of aforementioned plants, also of rhododendrons and of cherries (*Prunus*), in search of insects and nectar. Found in pairs or in small parties of up to eight or more individuals outside breeding season, occasionally singly or in larger parties of up to 25 birds; sometimes joins bird waves in company with other babblers. Frequents tall trees, feeding mostly among moss-cloaked and lichen-covered trunks and branches; also descends to undergrowth in search of berries.

**Breeding.** Apr–Jul. Nest a cup made of moss, lined with rootlets, placed near end of horizontal branch of small tree. Eggs pale blue. No other information.

**Movements.** Resident; minor altitudinal movements in winter.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Himalayas EBA. Locally common in NE India, where present in Mouling National Park, common in Namdapha National Park, and frequent in Eaglenest Wildlife Sanctuary, all in Arunachal Pradesh, but rare in Nagaland; possibly occurs also through S Assam to E Meghalaya. Uncommon in Myanmar, and uncommon in China.

**Bibliography.** Ali & Ripley (1948, 1971), Betts (1956), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2001, 2003), Godwin-Austen (1874), Grimmett *et al.* (1998), Katti *et al.* (1992), King *et al.* (2001), Kinnear (1934), Ludlow (1951), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1986, 2000), Singh (1995), Smythies (1940, 1949), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stattersfield *et al.* (1998), Zheng Zuoxin *et al.* (1983).

## Genus *LEIOPTILA* Blyth, 1847

### 283. Rufous-backed Sibia

#### *Leioptila annectens*

French: Sibia à dos marron German: Rotrückentimalie Spanish: Sibia Dorsirrufa  
Other common names: Chestnut-backed/Chestnut-rumped/Blyth's Sibia

**Taxonomy.** [*Leioptila*]. *annectans* [sic] Blyth, 1847, Darjeeling, West Bengal, India.

Usually placed in genus *Heterophasia*, and has been placed in *Minla*, but differs markedly in structure, behaviour and vocalizations. Until recently, race *davisoni* was thought to be a black-backed morph of *saturata*, but geographical ranges of the two are entirely discrete and both considered worthy of recognition. Individuals of this species in SE Laos of undetermined race, presumed to belong with race *roundi* of adjacent part of Vietnam. Six subspecies recognized.

#### Subspecies and Distribution.

*L. a. annectens* Blyth, 1847 – extreme E Nepal E to Bhutan, NE Indian hill states, N & W Myanmar and S China (W Yunnan).

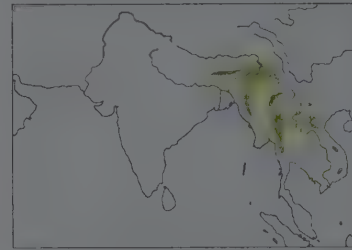
*L. a. saturata* Walden, 1875 – E Myanmar (W of R Salween) and NW Thailand.

*L. a. mixta* (Deignan, 1948) – E Myanmar (E of R Salween), N Thailand, N & C Laos, N Vietnam (N Tonkin, N Annam) and S China (SE Yunnan).

*L. a. davisoni* Hume, 1877 – S Myanmar (N Tenasserim) and W Thailand.

*L. a. roundi* (J. C. Eames, 2002) – Vietnam (S part of C Annam) and adjacent SE Laos.

*L. a. eximia* Riley, 1940 – S Annam, in S Vietnam.



**Descriptive notes.** 18.5–20 cm; 22–29 g. Distinctive sibia, black, white and rufous-chestnut above, white below with rufescent lower flanks. Nominate race has crown and head side (lores, cheek, ear-coverts) black, nape and upper mantle black with straggly white streaks, lower mantle and scapulars mixed chestnut-rufous and black (paler rufous on scapulars), back to uppertail-coverts chestnut-rufous; black tail broadly white-tipped; upperwing mostly black, with dull rufous tips on greater coverts and whitish edges of primaries, secondaries and tertials; chin, throat and underparts, including submoustachial area, white,

rufescent-buff on lower flanks and vent; iris brown to deep crimson; bill black, yellow base of lower mandible; legs wax-yellow. Sexes similar. Juvenile has shorter bill and narrower rectrices than adult. Race *mixta* is slightly darker rufous-chestnut above and slightly paler on vent than nominate; *saturata* has black lower mantle, chestnut back to uppertail-coverts; *davisoni* is similar to previous, but with reduced white streaking on mantle and black scapulars; *roundi* also is similar, but white below more extensive, with only tinge of buff on flanks; *eximia* is dark with reduced white streaking above, uppertail-coverts black, vent deep buff. Voice. Songs with loud, clear, pretty, descending warble, "wip'-i-iu-iu-ju" (nominate race), "wii-wii-wii-er-yu" (*eximia*), and slower, more even "it wi-wiu-ju" (*saturata*); song repeated every 5–11 seconds. Calls include harsh chattering when alarmed, and rapid, syncopated, chortling alternation of short buzzy fussing notes and harder downstrokes, e.g. "fss-uss-uss-che-che-wée-whéw-che-che-wée-whéw".

**Habitat.** Broadleaf evergreen forest, sometimes semi-deciduous forest, at 1000–2650 m, locally down to 215 m in NE India and N Myanmar; only 1000–1400 m in Bhutan (where replaced at higher elevations by *Malacias capistratus*), with winter record at 600 m (although possibly resident at this level).

**Food and Feeding.** Insects, including beetles (Coleoptera), and seeds. Found singly, in pairs, or in small parties of 3–6 individuals, often in bird waves with other babblers, e.g. *Siva cyanouroptera* and cutias. Usually forages methodically in middle to upper forest storeys, typically searching for food items among moss, lichen and bark crevices on larger limbs of trees and sometimes trunks.

**Breeding.** Apr–Jun. Nest a neat and compact cup, externally of moss, moss roots, leaves and fine grasses, inwardly of grass shreds, roots, herbaceous stems, bamboo and other leaves, lined with fine fibres, fine fern rootlets and rhizomorphs, placed 2–6 m above ground on branch of small tree (generally in fork of outer branch) or in upper branches of sapling. Clutch 2–4 eggs (usually 3 in India), very variable, often very pale blue-grey or green-grey to bright pale green-blue, with reddish-brown blotches, spots and lines over pale lavender and brown secondary blotches; incubation by both sexes; no information on duration of incubation and nestling periods.

**Movements.** Resident; some displacement to lower levels may occur in winter.

**Status and Conservation.** Not globally threatened. Rare and local in Nepal. Uncommon and local in Bhutan. Generally scarce but locally frequent in India, where present in Buxa Tiger Reserve (West Bengal), rare in Nameri National Park (Assam), and present in Eaglenest Wildlife Sanctuary and Namdapha and Mouling National Parks (Arunachal Pradesh). Uncommon to locally common in China. Generally uncommon to fairly common in SE Asian range. Present in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. In Vietnam, present in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam, and in Pu Mat Nature Reserve.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Barua & Sharma (2005), Bingham (1903), Birand & Pawar (2004), Cheng Tsohsin (1987), Choudhury (2003), Deignan (1948, 1963), Delacour & Jabouille (1931a), Eames (1995, 2002), Eames *et al.* (2001), Grimmett *et al.* (1998), Hume & Davison (1878), Inskipp & Inskipp (1991), Katti *et al.* (1992), King *et al.* (2001), Lekagul & Round (1991), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Oates (1883), Rasmussen & Anderton (2005), Robson (2000), Robson *et al.* (1993b), Round (1999), Singh (1995), Smith *et al.* (1943), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1935), Stresemann & Heinrich (1940a), Stuart Baker (1893, 1907), Tizard *et al.* (1997), van der Ven (2004).







3400 m), but reaches down to 1400 m where *A. egertoni* scarce (latter keeps to bushes and undergrowth and present species more in canopy where these two syntopic).

**Food and Feeding.** Mostly beetles (Coleoptera), caterpillars and other insects, also gastropods; also berries, seeds, flowers, including those of rhododendron, flower buds, moss and nectar. Outside breeding season found in small parties of 3–10 individuals, sometimes in bird waves, which often include such other babblers as minlas, sibilas and yuhinas. Forages mostly in upper branches of middle-sized trees, searching among moss and epiphytes; occasionally descends to or near ground.

**Breeding.** Apr–Jun; territories occupied and singing heard in Bhutan in Apr–Aug. Only described nest was a rather small neat compact cup, made of fine grasses with some lichen and moss on exterior, lined with rootlets, and placed in sapling. Clutch at least 2 eggs, pale pinkish-white with bold reddish-brown blotches and inky-grey secondary blotches. No other information.

**Movements.** Resident; some apparent minor movements to lower elevations during harsh winter weather at higher levels of range.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Himalayas EBA and Eastern Himalayas EBA. Fairly common in Nepal. Bhutan probably holds important populations, given the largely intact forest cover within the species' elevational range, including substantial stretches within protected areas; nevertheless, species mainly scarce, commonest in W valleys and Sunkosh valley, and present in Thrumshingla National Park. In India, fairly common in West Bengal, where present in Buxa Tiger Reserve, and rare farther E, where present in and/or near Eaglenest Wildlife Sanctuary, in Arunachal Pradesh. Rare in China.

**Bibliography.** Ali & Ripley (1972), Ali *et al.* (1996), Allen *et al.* (1997), Cheng Tsohsin (1987), Choudhury (2003), Grimmett *et al.* (1998), Harrison (1985), Inskipp & Inskipp (1991, 1993b), Inskipp *et al.* (2000), Ludlow & Kinnear (1937), Martens & Eck (1995), McCarthy (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1979), Spierenburg (2005), Stattersfield *et al.* (1998), Stevens (1923), Zheng Zuoxin *et al.* (1983).

## 285. Streak-throated Barwing

### *Actinodura waldeni*

**French:** Actinodure de Walden **German:** Yünnansibia **Spanish:** Actinodura de Yunán  
**Other common names:** Austen's/Walden's Barwig; Manipur Barwing (*waldeni*)

**Taxonomy.** *Actinodura waldeni* Godwin-Austen, 1874, Mount Japvo, Naga Hills, Assam, India. Has been thought to form a superspecies with *A. nipalensis*, and sometimes considered conspecific. Apparent hybrids between latter and present species (of race *daflaensis*) found in NE India (W Arunachal Pradesh). Four subspecies recognized.

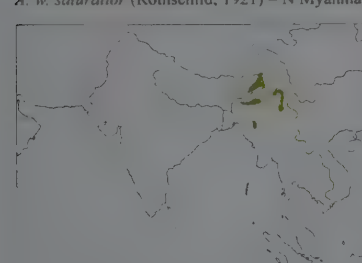
#### Subspecies and Distribution.

*A. w. daflaensis* (Godwin-Austen, 1875) – S China (SE Xizang) and adjacent NE India (C Arunachal Pradesh).

*A. w. waldeni* Godwin-Austen, 1874 – NE India (S Assam, Nagaland and N Manipur) and adjacent SW part of N Myanmar (Mt Saramati).

*A. w. poliotis* (Rippon, 1905) – W Myanmar.

*A. w. saturator* (Rothschild, 1921) – N Myanmar and S China (NW Yunnan).



tips; ear-coverts dull silvery grey with pale brown streaks, submoustachial area similar but darker brown basally; chin and throat rufous with broad buff feather edges, breast similar but edging narrower, rest of underparts plain; iris creamy grey to brownish-grey or pale olive; bill dark brown or dark horn to black; legs brown or dark horn to flesh-coloured. Sexes similar. Juvenile apparently undescribed. Race *poliotis* is like nominate, but paler body plumage with more distinct buff streaking on underparts; *saturator* is like nominate, but purer grey on head, posterior upperparts more chestnut, underparts with more even and contrasting buffish streaks from chin to belly; *daflaensis* is very different from others, with greyer-shaded crown, nape and neck sides, whitish throat, breast and belly diffusely streaked with brownish-grey, and greyish-ochre lower flanks and vent, thus superficially much more like *A. nipalensis*. Voice. Song a loud, strident, slightly wavering and rising phrase, starting with a slight rattle, and repeated every few seconds, "tchrrrr-jo-jwicee" or "dddrri-juee-iwee"; sometimes a shorter "jorr-dwidu". Calls include low, rather nasal grumbling "grrr-ut grrr-ut..." and "grr-grr-grr-grr-grr".

**Habitat.** Mossy broadleaf evergreen and mixed forest, oak and rhododendron forest, fir and hemlock forest, bamboo, at 1700–3300 m; in Indian Subcontinent probably above 2135 m only in summer, some descending as low as 1500 m, locally 500 m, in winter.

**Food and Feeding.** Insects, molluscs; fruits, including those of aromatic wintergreens (*Gaultheria*), berries, including certain ginsengs (*Heptapleurum*), seeds, including those of fairy bells (*Disporum*), brambles (*Rubus*) and ardisia (*Ardisia*), flower buds, lilaceous plants, and moss. Also visits rhododendron flowers to obtain insects or nectar. Occurs singly, in pairs or in small parties of 5–10 individuals, and often joins bird waves, which may include such other babblers as minlas, sibilas and yuhinas. Forages mostly in middle storey, on branches of middle-sized trees; also in lower branches of taller trees and in low bushes, searching among moss and lichen. Clammers around mossy tree trunks, pulling apart moss to find insects.

**Breeding.** Season extends until at least Oct in India. No further information.

**Movements.** Resident; movements to lower elevations during harsh winter weather at higher levels of range have been reported, but none clearly documented.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Himalayas EBA. Locally fairly common in India, where present in and/or near Eaglenest Wildlife Sanctuary, in Arunachal Pradesh; seen traded in Kohima, in Nagaland, during 1996–2001. Fairly common in Myanmar, but rare in Natmataung National Park. Race *daflaensis* considered very rare in China (Xizang).

**Bibliography.** Ali & Ripley (1972), Betts (1956), Cheng Tsohsin (1987), Choudhury (2001, 2003), Godwin-Austen (1874), Grimmett *et al.* (1998), Harrison (1985), Katti *et al.* (1992), King *et al.* (2001), Kinnear (1934), Ludlow & Kinnear (1944), McCarthy (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952, 1961, 1979), Robson (1986, 2000), Robson *et al.* (1998), Rothschild (1926), Singh (1995), Smythies (1940, 1949), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stattersfield *et al.* (1998), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thet Zaw Naing (2003).

## 286. Streaked Barwing

### *Actinodura souliei*

**French:** Actinodure de Soulié **German:** Tonkinsibia **Spanish:** Actinodura de Tonkin  
**Other common names:** Soulie's Barwing

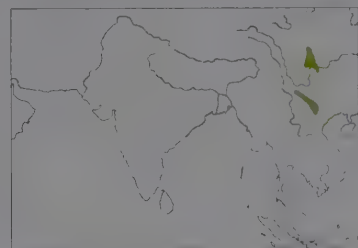
**Taxonomy.** *Actinodura Souliei* Oustalet, 1897, Tzeku, north-western Yunnan, China.

Race *griseinucha* considerably different from nominate, and may well warrant separation as a full species; research needed. Two subspecies recognized.

#### Subspecies and Distribution.

*A. s. souliei* Oustalet, 1897 – SC & S Sichuan and extreme NW Yunnan, in SC China.

*A. s. griseinucha* Delacour & Jabouille, 1930 – S China (C' & SE Yunnan) and N Vietnam (W Tonkin).



**Descriptive notes.** 21–23 cm. Relatively short-tailed rufous barwing with elongate and pointed crown feathers forming floppy crest, silvery ear-coverts and crown, heavy dark brown streaking above and below. Nominate race has forecrown and mid-crown feathers dark brown with bold buff-tan edges, hind-crown with elongate brown-streaked dull grey feathers; mantle and back dark brown with stony-buff feather edges forming blade-like streaks, lower upperparts with the two colours mixed and streaking less distinct; upperwing, including coverts, densely barred, rufous base colour on flight-feathers, greyer-brown on coverts and tertials; tail densely barred rufous and black all to white tail tips, latter broad except on central pair; lores, cheek and submoustachial stripe dark greyish, ear-coverts silvery grey with slight brown wash basally; underside with blade-like brown streaks on cold buff background, streaks densest on throat and breast, less distinct on lower underparts, where buff predominates, turning dirty ochrous on lower belly and vent; iris dark brown, whitish eyering; bill greyish; legs pale brownish-flesh. Differs from similar *A. waldeni* in having darker lores, more silvery ear-coverts and rear part of crown, heavy dark brown streaking above and below, contrasting buff on posterior upperparts and underparts. Sexes similar. Juvenile undescribed. Race *griseinucha* is distinctive, with blacker lores, much bolder and stronger black and ochre crown streaking, clearer and paler grey rear crown side and nape, strong ochre replacing stony-buff streaking above, becoming rufous on rear upperparts, black barring on primary coverts so dense as to be almost continuous, black barring on wings broader and on dark chestnut background, tail feathers slightly broader and blunter and with smaller white tips, streaking below darker (almost blackish-brown) and rufous-tinged ochre. Voice. Song undocumented. Calls include soft contact notes and harsh loud chirps in alarm, similar to those of *A. waldeni*.

**Habitat.** Broadleaf evergreen and semi-deciduous forest, open fir forest with bamboo, at 1700–3300 m, locally down to 1400 m; some as low as 1000 m in winter on Omei Shan (Sichuan).

**Food and Feeding.** Mainly invertebrates. Often in small, slow-moving parties; joins bird waves.

**Breeding.** No information.

**Movements.** Resident; minor altitudinal movements recorded during cold weather and heavy snow-fall.

**Status and Conservation.** Not globally threatened. Uncommon but distinctly under-recorded. Uncommon in China, where scarce at Emei Shan Protected Scenic Area. Uncommon in N Vietnam, where scarce in Fan Si Pan National Park.

**Bibliography.** Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Cheng Tsohsin *et al.* (1963), Delacour & Jabouille (1930, 1931a), Dowell *et al.* (1997), Étchécopar & Hùe (1983), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Meyer de Schauensee (1984), Robson (2000), Tordoff, Lê Minh Hùng *et al.* (2002), Tordoff, Lê Trung Dat *et al.* (2001), Wang Zhijun & Chen Huojie (1983), Wang Zhijun & Wei Tianhao (1983).

**Food and Feeding.** Mainly invertebrates. Often in small, slow-moving parties; joins bird waves.

**Breeding.** No information.

**Movements.** Resident; minor altitudinal movements recorded during cold weather and heavy snow-fall.

**Status and Conservation.** Not globally threatened. Uncommon but distinctly under-recorded. Uncommon in China, where scarce at Emei Shan Protected Scenic Area. Uncommon in N Vietnam, where scarce in Fan Si Pan National Park.

**Bibliography.** Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Cheng Tsohsin *et al.* (1963), Delacour & Jabouille (1930, 1931a), Dowell *et al.* (1997), Étchécopar & Hùe (1983), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Meyer de Schauensee (1984), Robson (2000), Tordoff, Lê Minh Hùng *et al.* (2002), Tordoff, Lê Trung Dat *et al.* (2001), Wang Zhijun & Chen Huojie (1983), Wang Zhijun & Wei Tianhao (1983).

## 287. Taiwan Barwing

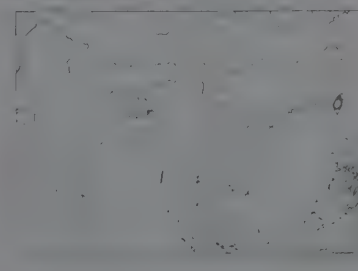
### *Actinodura morrisoniana*

**French:** Actinodure de Taiwan **German:** Formosasia **Spanish:** Actinodura de Formosa  
**Other common names:** Formosan Barwing

**Taxonomy.** *Actinodura morrisoniana* Ogilvie-Grant, 1906, Mount Morrison, Taiwan.

Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 18–19 cm; mean 32 g. Typical short-tailed barwing with chestnut hood, white-streaked grey breast and buff-and-rufous belly streaking. Crown and head side (lores, ear-coverts, submoustachial area) are chestnut, with dull rufous eyering, upperparts ochrous-grey, soft whitish streaks on nape and mantle becoming buffy-tan streaks on back, weakening and mingling on rump; greater coverts plain brown, primary coverts black with greyish tips, flight-feathers densely barred with black and rufous to buffish, greyer-brown on tertials; tail rufous basally, with increasingly dense black bars on buff-grey ground, and narrow white



tips; chin and throat rufous with soft buff-tan streaks, breast pale olive-grey with long soft-edged whitish streaks, belly olive-tinged rufous with long vague buff-tan streaking, mingling plainer on thighs and vent; iris dark greyish to brownish; bill dark grey to blackish or brownish-black; legs flesh-coloured to pinkish-slate. Sexes similar. Juvenile apparently undescribed. Voice. Song a loud clear "whit chiiwii" or "whit tchiyiwi" (the "whit" a short, quick introductory note, and the main part of song quavering somewhat and increasing in volume through latter half), repeated monotonously every 4–6 seconds. Rapid, slightly quavering "chiririrrit" or "jiririrrit", and "chiririrrit" "chru" or "chiririrrit chru", along with occasional short, clear "hiew", "hiu", "huu" or "juu", becoming "jia jia jia" when alarmed. Low contact notes include short "wut" notes, "wut-chk" and similar, and slightly rising "hwee" or "hwir".

**Habitat.** Mature broadleaf deciduous forest and broadleaf evergreen forest, mixed broadleaf-coniferous forest, at 1200–3000 m, mainly 1500–2700 m, with some possibly lower in winter; elevational limits in N Taiwan 2030–2780 m.

**Food and Feeding.** Mostly arthropods such as beetle larvae (Coleoptera), other insects and their larvae; also berries and seeds; berries of honeysuckle (*Lonicera*) seen taken. Found singly, in pairs or in small parties, often in company of *Malaciac auricularis*, as well as *Yuhina brunneiceps* and *Liocichla steerii*. Forages in canopy and middle storey of forest, but also down to understorey. Creeps among epiphytic growths and along branches, rummages among dead leaves, probes moss and pulls apart lichen in search of food, craning around branches and clinging to their undersides. Beetle larvae obtained by probing bark of trunks and branches.

**Breeding.** Apr–May. Nest bulky, with much moss added, placed on branch in canopy. No other information.

**Movements.** Resident. Reports of movements to lower elevations during harsh winter weather at higher levels of range, but none clearly documented.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Taiwan EBA. Common. In Yushan National Park, recorded density of 2.39 birds/ha in mixed coniferous forest, although this not a preferred habitat.

**Bibliography.** Cheng Tsohsin (1987), Ding Tsungu et al. (1997), Koh Chaonien & Lee Peifen (2003), Meyer de Schauensee (1984), Ogilvie-Grant (1906), Seeveringhaus & Blackshaw (1976), Stattersfield et al. (1998), Yen Chungwei (1990).

## 288. Rusty-fronted Barwing

### *Actinodura egertoni*

**French:** Actinodure d'Egerton **German:** Rotstimsibia **Spanish:** Actinodura de Egerton  
**Other common names:** Spectacled(!)/Himalayan/Nepal Barwing

**Taxonomy.** *Actinodura Egertoni* Gould, 1836, Nepal.

Appears to be closely related to *A. ramsayi*. Four subspecies recognized.

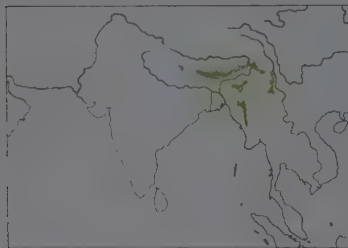
**Subspecies and Distribution.**

*A. e. egertoni* Gould, 1836 – C Nepal E to Bhutan and NE India (EC Arunachal Pradesh).

*A. e. levisi* Ripley, 1948 – E Arunachal Pradesh and NW Myanmar.

*A. e. khasiana* (Godwin-Austen, 1876) – Meghalaya, S Assam (N Cachar), Nagaland and Manipur, in NE India.

*A. e. ripponi* Ogilvie-Grant & La Touche, 1907 – Mizoram (NE India), and NE & SW Myanmar and S China (W & NW Yunnan).



**Descriptive notes.** 21.5–23.5 cm; 31–42 g. Long-tailed, unstreaked barwing with brownish-grey head and crest and chestnut forehead, face and chin. Nominative race has lores, upper malar area, anterior cheek, forehead and forehead central chestnut, shading to brown-edged smoky-grey elongate feathers on central crown to hindcrown; nape and neck side smudgy mid-grey, shading to ochrous-brown on upperparts; greater coverts rufous, primary coverts blackish, rest of upperwing rufous-chestnut to buffish basally with dense black-and-whitish barring distally; tail plain dull rufous-chestnut centrally, with closely but

weakly dark-banded outer feathers, all with whitish tips; ear-coverts slightly shiny pale grey with slight pinkish tinge; chin and throat dull chestnut-rufous with vague greyish streaking, shading to rufous-tinged pale pinkish-grey on breast and stronger rufous on flanks, thighs and vent, belly whitish; iris pale grey, bluish-brown, olive-yellow or brown, orbital skin grey-green; bill yellowish-brown, paler lower mandible; legs brownish-flesh to grey-brown or pale horn. Sexes similar. Juvenile has crown and nape washed warm brown. Race *levisi* is less rufescent above than nominate; *khasiana* is altogether paler, more olive-tinged above, buffier below, with more rufous-tan in wings; *riponi* is very like last, but crown greyer and with less chestnut. Voice. Song of nominate race described as a rapid, sweet, clear sequence of short piping, crystal-clear whistles, final note distinctly lower, and strophe decelerating, "(tsit-tsit-tsit) tsit-tsit-sééé-tsééé-tsééé", repeated every few seconds, also similar version with series rising slightly in pitch before dropping greatly to final low note; race *riponi* utters more warbled version with a few short notes dropping in pitch, and then repeated without pause, e.g. "ti-wi-wi-wu ti-wi-wi-wu", also as "titu-titu-tiyú titu-titu-tiyú"; *khasiana* song similar but notes said to be chipper and less modulated. Calls include excited, metallic, high-pitched rattles creating a wall of sound, and varying somewhat in pitch and tempo; also, lower-pitched, more irregular, harsh and buzzy versions, "grrit", "grrrrrit" and "gwhah" notes, and lower, harsh, buzzing, downslurred "gursh-gursh...", "gur", also "geers" notes; occasionally a quick series, "gur-geer-geer-gursh".

**Habitat.** Dense undergrowth, scrub-jungle, forest edge, shrubbery and scrub in warm broadleaf evergreen forest and secondary growth, bamboo. Breeds at 600–2600 m, mainly 1200–2400 m, perhaps lower locally in India (E Arunachal Pradesh, 300 m) and N Myanmar (215 m).

**Food and Feeding.** Insects, including grasshoppers (Orthoptera) and ants (Formicidae); also berries, including those of wild strawberries (*Fragaria*), figs (*Ficus*), and seeds, including those of "laurel". Found in pairs during breeding season; otherwise typically in small monospecific parties of 6–12 individuals. Sometimes larger bands of up to 45 birds, but moving within well-defined home range. Often associates with bird waves, particularly with other babblers such as laughingthrushes and sibilas. Forages in middle storey of forest, occasionally in canopy, among tree-orchids and epiphytes, and among dense scrub, bushes, brambles etc. along forest edge.

**Breeding.** Apr–Jul. Nest described as a largish, rather deep cup, made of fern, bamboo or other dead leaves, grasses, fibrous roots and green moss, lined with rootlets, fine moss roots and fine grasses, placed 1–7.5 m above ground in bamboo clump, bush or sapling. Clutch 2–4 eggs (usually 3 in India, and 2–3 in Myanmar), blue or pale blue-green with blackish and/or dark brown to pink

reddish-brown blotches, spots and whorls over pale lilac-grey or purplish undermarkings. No other information.

**Movements.** Resident. Movements to lower elevations during harsh winter weather reported, but none clearly documented.

**Status and Conservation.** Not globally threatened. In C Nepal rare and local, becoming slowly commoner to E of range in Himalayas. Frequent in Bhutan but less common in W; near Zhemgang, density of 1.6 territories/km of road at 1900 m; present in Thrumshingla National Park. Locally fairly common in India, where present in Buxa Tiger Reserve (West Bengal) and in and/or near Eaglenest Wildlife Sanctuary and common in Namdapha National Park (Arunachal Pradesh). One 19th-century specimen from Bangladesh, but no other records from that country. Common in Myanmar, but uncommon in Natmataung National Park. Uncommon in China.

**Bibliography.** Ali & Ripley (1972), Ali et al. (1996), Allen et al. (1997), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Choudhury (2003), Godwin-Austen (1870), Grimmett et al. (1998), Harington (1909, 1914a), Hopwood & Mackenzie (1917), Inskipp & Inskipp (1991, 1993b), Inskipp et al. (2000), Katti et al. (1992), King et al. (2001), Koelz (1954), Ludlow & Kinnear (1937, 1944), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952), Robson (2000), Rothschild (1926), Singh (1995), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1914, 1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thet Zaw Naing (2003), Ticehurst (1933), Tymstra (1993), Venning (1912).

## 289. Spectacled Barwing

### *Actinodura ramsayi*

**French:** Actinodure de Ramsay **German:** Brillensibia **Spanish:** Actinodura de Ramsay  
**Other common names:** Ramsay's Barwing

**Taxonomy.** *Actinodura Ramsayi* Walden, 1875, Karenni State, Upper Myanmar.

Appears to be closely related to *A. egertoni*. Individuals of this species present in N Thailand and N & C Laos (like *yunnanensis* but greyer above, with buffy rufous restricted to forehead) evidently represent an undescribed race. Three subspecies recognized.

**Subspecies and Distribution.**

*A. r. radcliffei* Harington, 1910 – EC & E Myanmar.

*A. r. ramsayi* (Walden, 1875) – SE Myanmar and NW Thailand.

*A. r. yunnanensis* Bangs & Phillips, 1914 – S China (SE Yunnan, SW Guizhou, W Guangxi) and N Vietnam (Tonkin).



**Descriptive notes.** 23.5–24.5 cm; 35–43 g. Long-tailed, unstreaked barwing, densely barred on wings and tail, plain buff below, and with bold white eyering. Nominative race has forehead milky rufous-buff, shading quickly to pale rufous-tinged olive-greyish on upperparts; tail rufescent olive-grey, evenly and narrowly barred blackish-grey and with narrow white tips; primary coverts black, upperwing and coverts otherwise strongly barred with black, base colour pale greyish-brown on coverts and scapulars, rufous-tan on flight-feathers but fading distally; lores to cheek blackish, face (rear supercilium, ear-coverts and lower

submoustachial area) milky brownish-grey; chin and upper submoustachial area milky rufous-buff, shading to plain buff on underparts, but mid-belly white; iris brown; bill blackish to pale dusky horn, slightly paler tip; legs pale plumbeous to greenish-grey. Sexes similar. Juvenile apparently undescribed. Race *yunnanensis* is more rufescent above and below than nominate, has uniform buffy-rufous crown and nape and often narrow blackish throat streaks; *radcliffei* is roughly intermediate between nominate and previous in colour (both above and below), but has rufescent-brown (not blackish) lores. Voice. Song a quite quickly repeated, rather mournful, high-pitched, bouncing, descending "iee-iee-iee-iuu"; sometimes accompanied by (perhaps from female) a high-pitched, even, forced phrase of 2–3 notes, "ewh ewh ewh". Calls include low harsh "baoh" and "berh" notes.

**Habitat.** Forest edge, secondary growth, scrub and grass, taller undergrowth in broadleaf evergreen forest, bamboo; in Laos commoner in *Fokienia*-dominated forest than in dry evergreen forest. Found at 1000–2500 m; locally down to 450 m in China and to 610 m in Myanmar.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. Typically occurs in pairs or small groups, often associating with other species, including other babblers, in bird waves.

**Breeding.** Mar–Apr. One nest was a cup made of yellowish roots, lined with finer roots and with exterior interweaving of feathery material from the half-dried creeper in which it was placed, above some rocks. Clutch 2 eggs, pale blue-green with a few bold blotches and scrolls of purplish-chocolate. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common in S China, but recently recorded only in Diding Nature Reserve (Guangxi) and in none of 53 other sites surveyed. Common in much of rest of range, including in Doi Inthanon National Park, in Thailand. Frequent in Nakai-Nam Theun National Biodiversity Conservation Area, in Laos. Scarce in Tam Dao National Park, in Vietnam.

**Bibliography.** Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1960), Cook (1913), David-Beaulieu (1944), Davidson (1998), Deignan (1963), Delacour & Jabouille (1931a), Evans & Timmins (1998), Kinnear (1929), La Touche (1923), Lee Kwok Shing et al. (2006), Lekagul & Round (1991), Livesey (1935), Meyer de Schauensee (1934, 1946, 1984), Oates (1883), Rippon (1897, 1901), Robson (2000), Showler, Davidson, Khounmee Salivong & Khamkhoun Khounboline (1998), Smith et al. (1940), Smythies (1986), Tizard et al. (1997), Tordoff et al. (2002), Uchida & Kuroda (1916), Wickham (1929), Wu Zhikang et al. (1986).

## 290. Black-crowned Barwing

### *Actinodura sodangorum*

**French:** Actinodure à calotte noire **Spanish:** Actinodura Coroninegra  
**German:** Schwarzscheitelibia

**Taxonomy.** *Actinodura sodangorum* J. C. Farnes et al., 1999, Ngoc Linh, Kon Tum Province, Vietnam.

Monotypic.

**Distribution.** E part of S Laos and adjacent C highlands of C Annam, in Vietnam.



**Descriptive notes.** 24 cm. Long-tailed barwing, grey-headed with dark crown, densely barred on tail, rufous below with dark throat streaks, and with bold white eyering. Has lores black, central crown to mid-nape black, with some pointed whitish feathers at bill base and dull grey-edged black forehead feathers; cheek, ear-coverts, crown side and nape slightly pinkish-tinged dull grey with vague blackish streaks; upperparts dirty dull ochre; upperwing black, buff barring on coverts, narrow buff barring on outer webs of outer primaries and dull vague chestnut barring on outer webs of inner primaries; tail pale

buffy ochre with narrow blackish bars, rufous-tinged basal fringes and narrow whitish tips; rich ochrous-rufous below, duller on rear flanks and thighs, duller and darker on vent, and with bold black streaking radiating from chin (including submoustachial area) onto throat; iris dark brown; bill horn, base of lower mandible slightly more pinkish; legs grey-horn. Differs from superficially similar *A. ramsayi* (of race *yunnanensis*) in having throat streaks bolder, crown and nape buff-tinged mid-grey with thick black cap breaking up as black streaks on nape and mantle, no rufescent tones on upperparts, tail more heavily barred, wings largely black, greater coverts with prominent buff-marked outer webs, flight feathers with tiny amount of chestnut at bases and only vestigial barring. Sexes similar. Juvenile undescribed. Voice. Song begins hurriedly, becoming more clearly

spaced and phrased at end, "tutututu'tu'tudi-duuu" or "tututututu'tu'tuee-tuuu", presumed female occasionally adding low grumbling or whining "hwerrr'r'r'r" or "hwew-hwer" notes; similar to that of *A. ramsayi*.

**Habitat.** Forest edge, secondary growth, more open broadleaf evergreen forest, tall grass and scrub adjacent to forest (broadleaf evergreen and open pine woodland), small forest fragments with banana groves amid shifting cultivation; at 1000–2400 m.

**Food and Feeding.** No information on diet; presumably invertebrates and some vegetable matter. All sightings have been of single individuals or pairs, with one record of association with *Malacius desgodinsi*. When in forest, has typically been observed in canopy and feeding around tree boles and larger moss-covered branches.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species; present in Kontum Plateau Secondary Area (which now becomes a full EBA with discovery also of *Trochalopteron ngoclinhense*). Not uncommon but very local; known from only two areas, and assumed to have a small range and population. Presumably declining in response to widespread habitat loss and degradation, including shifting cultivation and road construction, across its projected range. May, however, prefer secondary and marginal forest habitats (as does *A. ramsayi*), and perhaps less seriously affected by deforestation. Occurs in Ngoc Linh Nature Reserve, boundaries of which were established in 1999, now the subject of a conservation project.

**Bibliography.** Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Eames (2001), Eames, Lê Trong Trai, Nguyễn Cu & Eve (1999), Nguyễn Cu *et al.* (2000), Robson (2000), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Stattersfield & Capper (2000).





PLATE 22

Family TIMALIIDAE (BABBLERS)  
SPECIES ACCOUNTS

Genus *MYZORNIS* Blyth, 1843

291. Fire-tailed Myzornis

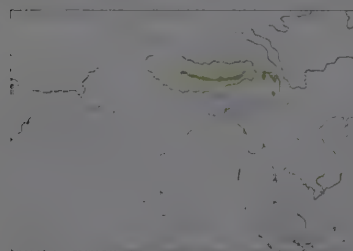
*Myzornis pyrrhaura*

French: Myzorne queue-de-feu German: Feuerschwänzchen Spanish: Timalí Melero

**Taxonomy.** *Myzornis pyrrhaura* Blyth, 1843, Nepal.

Relationships uncertain; further study required. Monotypic.

**Distribution.** C Nepal E to Bhutan, NE India (Arunachal Pradesh), N Myanmar and S China (S & SE Xizang, NW Yunnan).



**Descriptive notes.** 11–13 cm; 10–13 g. Bright green species with black mask and crown scalloping, red flash in black-and-white wing, red-sided tail, and rather long, thin, slightly decurved black bill. Male has crown and entire upperparts bright green, brightest around narrow black mask from bill base to behind eye, crown with rounded black feather centres (creating scalloped effect); underparts a shade paler, with dull soft-edged reddish triangle from mid-throat to upper breast, pale blue wash on lower breast and belly, deep orange-buff lower belly and vent; primary coverts tipped white, upperwing black with white tips, but

outer primaries fringed dark blue basally, white distally, inner primaries and secondaries fringed red basally and shading through yellow to white distally, tertials with white inner webs; tail dull dark green with fiery-red outer fringes and broad black tips; iris dark brown to red; bill black; legs yellowish brown. Female is similar to male but duller and less glossy, with narrow black centres of crown feathers, more pale blue on underparts, breast triangle fainter, vent duller. Juvenile apparently undescribed. **Voice.** Calls include extremely thin, high-pitched, often quickly repeated "si" notes, hence sometimes a lilting "sis-si-si-si" in irregular bursts, some notes slightly lower and stressed; used for contact.

**Habitat.** Mossy juniper and rhododendron scrub, oak-rhododendron forest, bushes, low trees in evergreen forest, and bamboo. At 2000–3950 m in summer in Indian Subcontinent and Xizang;

mainly above 2800 in Nepal and Bhutan, and descending to 1600 m in winter; at 2440–3660 m, down to 1800 m in winter, in Myanmar; rarely, to 4265 m in China.

**Food and Feeding.** Spiders (Araneae), small flies (Diptera) and other insects; also berries, including raspberries, flower nectar and tree sap. Regularly visits flowering shrubs and trees (rhododendron, *Berberis* etc.) for nectar and insects. Found singly, in parties of 3–5 individuals, or in small flocks of up to 30 (last possibly associated with concentrated food resource), often with other species, including other small babblers. Forages in bushes and shrubs, sometimes up in trees; also searches among moss on branches and tree trunks. Hovers in front of flowers and probes into them; alights on trunks to drink oozing sap; finds insects behind bark. Occasionally makes flycatching sallies.

**Breeding.** Apr–Jun in India and Nepal, but pair with juveniles in mid-Sept at 3400 m in Bhutan suggests relatively extended breeding season. Nest, built by both sexes, a globular structure of moss, lined with flakes of rhododendron bark, 1–6 m above ground and embedded in existing moss on bank or rock face or moss and lichen on trunk of large juniper. Eggs white; nestlings fed by both sexes. No other information.

**Movements.** Resident; altitudinal descent evident from Oct, return movement from Mar apparently following progressive upslope flowering of rhododendrons.

**Status and Conservation.** Not globally threatened. Generally somewhat scarce. Uncommon and local in C & E Nepal, where local in Langtang National Park. Frequently recorded but sparsely distributed throughout temperate and alpine zones in Bhutan, where present in Thrumshingla National Park. Locally common E from Sikkim to NE India, where present in and/or near Eaglenest Wildlife Sanctuary, in Arunachal Pradesh. Uncommon in Myanmar. Rare in China.

**Bibliography.** Ali & Ripley (1972), Cheng Tsohsin (1987), Choudhury (2003), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), King *et al.* (2001), Kinnear (1934), Ludlow & Kinnear (1944), Meyer de Schauensee (1984), Rand (1967), Rasmussen & Anderon (2005), Robson (2000), Rothschild (1926), Singh (1995), Smythies (1940, 1949), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1941), Stanford & Ticehurst (1935, 1938), Stevens (1923), Tymstra (1993).

Genus *MALIA* Schlegel, 1880

292. *Malia*

*Malia grata*

French: Malia des Célèbes

German: Mooswaldtimalie

Spanish: Timali Malia

**Other common names:** Celebes/Sulawesi Malia, Malia Babbler

**Taxonomy.** *Malia grata* Schlegel, 1880, Makassar District, Sulawesi. Affinities unclear; has been treated as an aberrant bulbul (Pycnonotidae). Research, including molecular-genetic analysis, is required. Three subspecies recognized.

**Subspecies and Distribution.**

*M. g. recondita* A. B. Meyer & Wilesworth, 1894 – N Sulawesi.

*M. g. stresemanni* Meise, 1931 – C & SE Sulawesi.

*M. g. grata* Schlegel, 1880 – SW Sulawesi.



**Descriptive notes.** 28 cm. Large babbler not unlike a *Turdus* thrush, dull olive-green above and bright greenish-yellow below. Nominative race has crown and upperparts dull yellowish olive-green, upperwing and tail green-tinged greyish-brown, underside lemon-yellow, brightest on chin and throat, with greenish-washed breast and flanks and dull yellow-tinged olive thighs and vent; lores and vague superciliary area yellow-stippled dull green, ear-coverts dull green with long thin yellowish streaks, submoustachial area yellow with vague dull greenish mottling; iris brown; upper mandible blackish, lower mandible yellowish;

legs greenish-brown. Sexes similar. Juvenile apparently undescribed. Race *recondita* has wings and tail more greenish-tinged, bill smaller, lower mandible duller (less distinct from upper mandible); *stresemanni* has wings and tail strongly rufous-tinged, bill size as previous. Voice. Song by group a loud mid-pitched cacophony of guttural warbling and rapid harsh chattering or grating sounds lasting for 2–2 seconds, repeated at intervals of 8–15 seconds; typically, one individual warbles while another gives continuous chatter or repeated grating note. Calling by group comprises a penetrating high whistle, “tiu”, repeated several times and immediately accompanied by rapid harsh “tsut-sut-ká-ká” (duration of about 1–2.75 seconds, intervals 1.5–5.5 seconds); other calls include thin, high repeated alarm note when flushed. Group vocalizations often introduced by single individual giving hoarse upslur followed by harsh chatter; after 12–17 seconds other birds join in with calls of various types, including slurred “chit chit chit”, nasal squeals, insistent coarse nasal calls, and brief upslurred “squeow!” whistle; such calls given while foraging, mobbing intruder, registering presence of nearby hawk (*Accipitridae*).

**Habitat.** Primary montane forest, mossy ridge-top forest, and occasionally disturbed forest, at 900–2400 m.

**Food and Feeding.** Invertebrates, including beetles (Coleoptera) and grasshoppers (Orthoptera). Uses bill to dig in rotten wood, dislodge moss and loose bark, and glean from trunks and large branches. Usually in small parties of 3–7 individuals, sometimes in pairs, and generally accompanied by Sulawesi Drongo (*Dicrurus montanus*), Rusty-bellied Fantail (*Rhipidura teysmanni*), Yellow-billed Malkoha (*Phaenocarpa caryocorythos*) and Sulawesi Leaf-warbler (*Phylloscopus sarasinorum*); sometimes forages close to Sulawesi dwarf squirrel (*Prosciurillus murinus*) and whitish dwarf squirrel (*Prosciurillus leucomus*).

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sulawesi EBA. Widespread and locally moderately common. Fairly common (race *recondita*) in Gunung Ambang Nature Reserve, and present in Bogani Nani Wartabone (Dumoga Bone) National Park, in N Sulawesi; fairly common in Lore Lindu National Park, in NC Sulawesi.

**Bibliography.** Coates & Bishop (1997), Ekstrom *et al.* (1998), Meise (1931b), Meyer & Wilesworth (1898b), Riley & Mole (2001), Rozendaal & Dekker (1989), Stattersfield *et al.* (1998), Stresemann & Heinrich (1940b).

## Genus RHOPHILUS

Giglioli & Salvadori, 1870

### 293. Chinese Bush-dweller

#### *Rhopophilus pekinensis*

**French:** Rhophilus de Pékin **German:** Pekingsänger **Spanish:** Timali Pekinés  
**Other common names:** Chinese/Grey-browed Babbler, White-browed Bush-dweller/Chinese Warbler, Chinese Hill Warbler, Peking Warbler

**Taxonomy.** *Drymoea* (?) *pekinensis* Swinhoe, 1868, Beijing, China.

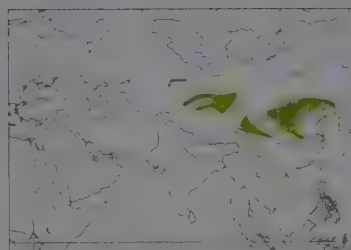
Affinities uncertain; has been placed in family Cisticolidae. Very recent DNA analyses, however, appear to support placement in present family, where should perhaps be positioned close to genera *Chrysomma* and *Chamaea*. Proposed race *leptorhynchus* (from F Qinghai and Gansu) rather weakly defined and seems to fall within range of variation of nominate; tentatively treated as synonym of latter. Two subspecies recognized.

**Subspecies and Distribution.**

*R. p. albosuperciliaris* (Hume, 1873) – NW China from W Xinjiang E to W Nei Mongol and W Qinghai.

*R. p. pekinensis* (Swinhoe, 1868) – C & E China (SE Qinghai and C & S Gansu E to Shaanxi and NE Sichuan, and from S Nei Mongol and S Liaoning S to SW Henan and NE Hubei) and N Korea.

**Descriptive notes.** 15–17 cm. Small passerine resembling a cisticolid warbler, with graduated tail very long (half of bird's total length), plumage pale grey and sandy with heavy dark streaks above, white with pale rufous streaking below. Male nominate race has crown and upperparts buffy grey with broad dark brown streaks arranged in neat lines, streaks broader and longer on back; upperwing dark brown with pale brown fringes, tail pale brown centrally, outer rectrices dark brownish-grey with pale greyish tips; blackish lores, pale buff-grey supercilium, pinkish buff-grey ear-coverts, bold black submoustachial stripe, grey-streaked dull rufous neck side; white chin and malar area to vent,



with long rufous stripes on flanks and belly; iris yellowish-grey; bill pale brown; legs pale brownish-ochre to flesh. Female is similar to male, but tail slightly shorter, belly streaks perhaps less rich. Juvenile apparently undescribed. Race *albosuperciliaris* is larger and much paler than nominate, base colour of upperparts greyish-tinged creamy buff, supercilium buff, head side greyish-buff, underparts creamy with rufous streaks very faint. Voice. Not adequately documented. Song described as a sweet continuous “dear, dear, dear”, starting on high note that falls away quickly and then rises at start of second syllable; rich “chee-anh” calls given in duet.

**Habitat.** Dry stony montane scrub, bush-covered hill slopes, tamarisks, long grass with scattered trees (including pines) and bushes, rough lowland scrub, also reed clumps; one record from ornamental park hedge.

**Food and Feeding.** No information on diet; presumably invertebrates. Forms flocks outside breeding season, sometimes associating with other babblers. Forages in vegetation, but runs well on ground.

**Breeding.** May. Nest a substantial deep cup of soft grasses, thickly bound with strips of grass, reinforced externally with cobweb, cocoons and animal hair, placed low down in bush. Clutch 4–6 eggs, greenish-white with speckling and blotching of dark violet and earth-brown. No other information.

**Movements.** Resident, with some apparent winter displacements, e.g. to parts of S Korea.

**Status and Conservation.** Not globally threatened. Uncommon within comparatively enormous range. Around Beidaihe, in E China (S Liaoning), numbers may have increased from 1940s to 1980s, but recent large-scale land development has probably reversed this trend. Considered very common in mountains of Hebei c. 90 years ago. Records have declined in number in N Korea since 1950s. Was probably formerly a rare resident in Kyonggi-do, in S Korea, but no records since 1964.

**Bibliography.** Anon. (2003d, 2004c), Cheng Tsohsin (1987), Duckworth (2006), Etchécopar & Hile (1983), Gore & Won Pyong-Oh (1971), La Touche (1925–1930), MacKinnon & Phillips (2000), Meyer de Schauensee (1984), Oustalet (1893), Shaw Tsenhwang (1936), Tomek (2002), Vaurie (1972).

## Genus LIOPTILUS Bonaparte, 1850

### 294. Bush Blackcap

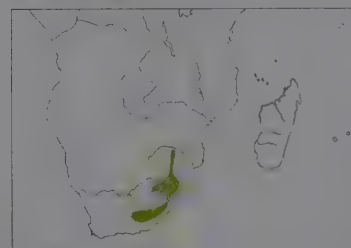
#### *Lioptilus nigricapillus*

**French:** Lioptile à calotte noire **German:** Buschschwarzköppchen **Spanish:** Lioptila Capirotada  
**Other common names:** Blackcap Mountain Babbler

**Taxonomy.** *Turdus nigri capillus* [sic] Vieillot, 1818, forests of Bruintjes Hoogte, near Somerset East, Cape Province, South Africa.

Affinities unclear. Has been suggested as being an aberrant bulbul (Pycnonotidae), but latest evidence points towards a link with “warbler” genus *Sylvia*; further research required. Monotypic.

**Distribution.** E South Africa (S along escarpments to extreme E Free State and C Eastern Cape) and W Swaziland.



**Descriptive notes.** 17–19 cm; 26–34 g. Small bulbul-like passerine with orange-pink bill, black cap and chin, olive upperparts, grey throat and breast and white belly. Has crown (including area around eye) to mantle jet-black, rest of upperparts warm olive-brown, upperwing and tail marginally darker; chin black, submoustachial area, cheek, ear-coverts, neck side and throat to belly pale grey, shading paler and more olive on flanks, thighs and vent, middle to lower belly whitish; iris reddish-brown to dark brown, very narrow pinkish eyering; bill pale orange to coral-pink; legs dull pink to brownish-flesh. Sexes similar. Juvenile is

duller and paler above, browner-washed below, bill dusky-pink. Voice. Song by male when breeding, and by female when building nest, a loud lively jumble of melodious phrases and notes, “peeu peeu peeu whit-whit-whit-whit”, “cheep-ta-woy, cheep-cheep-ta-woy”, “cho-woy, cheep-cheep-cho, cho-wee-cho”, deeper, richer and more purposeful than those of *Pycnonotus* bulbul. Alarm call a fairly loud, guttural “burgg”; soft churring at nest.

**Habitat.** Temperate and montane mist-belt broadleaf evergreen forest on slopes, in ravines and kloofs, forest edge and adjacent scrub and thickets, especially with ouhout (*Leucosidea sericea*) and sagewood (*Buddleia*). Usually at 750–1825 m, but recorded down to 600 m in winter months, and down to coast in May, then occupying coastal forests and valley bushveld, occasionally ferns and shrubs in gardens.

**Food and Feeding.** Small berries, fruits and invertebrates. Found singly, in pairs or in small groups, sometimes with other frugivores in fruiting trees. Forages quietly and unobtrusively with slow deliberate movements through middle layer of forest edge or low down in scrub, plucking fruit and gleaning insects from foliage. One often drank at small fish pond in suburban garden in winter.

**Breeding.** Oct/Nov–Jan. Nest, built by both sexes, a simple, neat cup of grass, leaves, fine blackish twigs and other twigs, roots, forbs and tendrils, lined with rootlets, bark strips, fine twigs and animal hair, placed 1–6 m above ground in fork in leafy subcanopy of tree or bush, often in tree on edge of wood or overlooking wet area. Clutch 2–3 eggs, dull white with pale brown, rusty and slate-grey streaks; no information on incubation and nestling periods. One nest parasitized by Jacobin Cuckoo (*Clamator jacobinus*).

**Movements.** Resident and partial elevational migrant. Populations breeding in high Drakensberg winter in lower forests, covering up to 300 km and intermingling with sedentary populations; occasional extralimital records S & W to coast indicate overshooting migrants or juvenile dispersal.



**Bibliography.** Anon. (1980b, 2006d), Butchart & Stattersfield (2004), Clancey (1985), Fry *et al.* (2000), Harrison *et al.* (1997), Hockey *et al.* (2005), McClelland (1999), McKechnie (1975), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

**French:** Parophasme de Galinier      **German:** Singtimalie      **Spanish:** Charlatán Abisinio  
**Other common names:** Abyssinian Babbler/Catbird

**Distribution.** Highlands of N (Simien), W & S Ethiopia.

**Descriptive notes.** 17–19 cm. Dull grey babbler-like passerine with blackish lores, whitish forehead and rufous-chestnut vent. Lores are blackish, forehead to mid-crown greyish-white, shading to dull olive-tinged mid-grey on upperparts and underparts; slaty-grey upperwing with blackish outer greater coverts and primary coverts, slaty-grey tail; mid-belly slightly purer grey, lower belly, thighs and vent rufous-chestnut; iris crimson to reddish-brown; bill black; legs dark brown. Sexes similar. Juvenile is paler grey than adult, with paler rufous vent. Voice. Male song, given throughout day (especially in rain), a fine melodious war-

bling trill lasting 3–4 seconds, becoming louder and sharper, decelerating at end, and answered by female with low dry churr or purr. Calls apparently unreported.

**Habitat.** Dense thickets and tangles of vegetation in juniper woodland, giant heather, St John's-wort (*Hypericum*), highland bamboo, olive trees, *Podocarpus* and other tall trees, often in steep-sided valleys and ravines; also in well-wooded gardens in Addis Ababa. At 2440–3655 m.

**Food and Feeding.** Juniper berries and other small fruit. Found in pairs or in parties of up to eight individuals. Generally keeps within dense tangles of vegetation; moves in purposeful bounds along branches.

**Breeding.** Jan-Jul. Nest a frail thin cup made of fine plant stems, loosely placed c. 5 m above ground on top of 2-3 small branches and vines and *Galium*, in top of *Hypericum lanceolatum* and shaded by tangle of vines. Clutch 2 eggs, pale flesh-coloured, uniformly covered with fine flesh marks and a few dark chestnut spots; incubation period 16-18 days; nestling period 15-18 days. Recorded longevity 6 years.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common to common resident. Present in Bale Mountains, Simien Mountains and Entoto Natural Parks, and in at least five other Important Bird Areas in Ethiopia.

**Bibliography.** Fishpool *et al.* (1996), Friedmann (1937), Fry *et al.* (2000), Hall & Moreau (1970), Mackworth-Praed & Grant (1960), Reichenow (1905), Rüppell (1845), Urban & Brown (1971), Urban *et al.* (1970), Vivero Pol (2001).

**French:** Horizorin de Dohrn      **German:** Prinzendrossling      **Spanish:** Timali de Principe  
**Other common names:** Dohrn's Thrush-babbler/Flycatcher

**Taxonomy.** *Cuphopterus dohrni* Hartlaub, 1866, Principe Island, Gulf of Guinea. Relationships uncertain. Has been considered to be a thrush (Turidae) or an Old World warbler (Sylvidae), and in recent years generally treated as an Old World flycatcher (Muscicapidae). Perhaps unlikely to belong in present family (which exhibits inability to cross large stretches of water), and vocalizations indicate possible link with warbler genus *Sylvia*; on the other hand, bill morphology similar to that of *Iladopsis*, and voice resembles also those of *Kuopeornis* and *Pyrcticus*, supporting placement in present family. Further research required. Monotypic.

[illegible]

**Habitat.** Bushes and small trees, also bases of crowns of taller trees in all wooded areas, including primary forest, secondary forest, cocoa and coconut plantations, bushy country and villages; at all elevations.

**Food and Feeding.** Caterpillars, ants (Formicidae), beetles (Coleoptera), other insects, and small snails; also berries and seeds, including those of *Trema* bushes and large African corkwood trees (*Musanga*); young fed mainly by berries. In pairs or in parties of up to eight individuals, occasionally 20; sometimes in mixed parties with Principle Golden Weaver (*Ploceus princeps*) and Principle Glossy Starling (*Lamprolaima ornatus*). Forages low among vegetation of understorey and undergrowth, gleaming in manner of a bulbul (Pycnonotidae) or a Cossypha robin-chat; pokes into bark crevices, inspects undersides of branches, climbs on trunks; sallies after insects, captured with audible snaps of bill.

**Breeding.** Jun–Sept, or possibly Jun–Jul and Sept–Jan; probably double-brooded. Nest a fragile thin-bottomed and unlined open cup made of dry leaves of herbs or dead grass; one nest, 3.5 m up in fork of small bough in cocoa tree, held two young. No other information.

**Movements, Resident.**

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Principe EBA. Abundant in cocoa plantations and forest regrowth and in other bushy country; perhaps less common in coconut plantations. Increased use of pesticides was raised as a cause for concern in early 1990s, but not subsequently.

**Bibliography.** Atkinson, Dutton *et al.* (1994), Atkinson, Peet & Alexander (1991), Borrow & Demey (2001), Christy & Clarke (1998), Dohrn (1866), Fry *et al.* (2000), Jones & Tye (1988, 2006), Keulemans (1866), de Naurois (1994), Snow (1950), Stattersfield *et al.* (1998).







## PLATE 23

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *PTERUTHIUS* Swainson, 1832

#### 297. Black-headed Shrike-babbler

##### *Pteruthius rufiventer*

**French:** Alouette à ventre roux **Spanish:** Timali-alcaudón Ventrirrufo  
**German:** Rotbauch-Würgertimalie  
**Other common names:** Rufous-bellied Shrike-babbler

**Taxonomy.** *Pteruthius*, *rufiventer* Blyth, 1842, no locality = Darjeeling, West Bengal, India. Relationships of genus uncertain; most of recent studies suggest that it does not belong in current family, and recent molecular analyses indicate that it should be placed in the New World family Vireonidae. Two subspecies recognized.

##### **Subspecies and Distribution.**

*P. r. rufiventer* Blyth, 1842 – C & E Nepal E to NE India (Arunachal Pradesh, Nagaland, Manipur), W & NE Myanmar and S China (W & C Yunnan).  
*P. r. delacouri* Mayr, 1941 – W Tonkin (Fan Si Pan Mts), in N Vietnam.



**Descriptive notes.** 18.5–20 cm; 32–48 g. Large shrike-babbler, male with glossy black head, wings and tail and chestnut upperparts, female with black crown and yellow-green upperparts. Male nominate race has crown, nape and head side (lores, cheek and ear-coverts) black with dark blue-green gloss, upperparts chestnut; upperwing as crown, chestnut tips of tertials, tail as crown but with chestnut tips; chin and upper submoustachial area white, shading to pale grey on lower submoustachial area to mid-breast, cutting abruptly to brown-tinged pale pinkish on belly, breast side with dull yellow patch; iris blue-grey to purplish-black, orbital skin grey; upper mandible black to dusky, lower mandible pale grey or blue-grey; legs pale pinkish-brown to chocolate-brown. Female has black crown with mid-grey streaks, all-black nape, yellow-tinged olive-green upperparts, wing fringes and central tail, black primary coverts, chestnut rump and tips of tertials and tail; mid-grey head side and neck side, becoming slightly paler on breast, lower underparts darker than on male, with only vague yellowish stain on breast side. Juvenile male has crown and nape duller, tinged brown, mantle mixed with yellowish-green feathers. Race *delacouri* male is slightly darker chestnut above than nominate.

grey to purplish-black, orbital skin grey; upper mandible black to dusky, lower mandible pale grey or blue-grey; legs pale pinkish-brown to chocolate-brown. Female has black crown with mid-grey streaks, all-black nape, yellow-tinged olive-green upperparts, wing fringes and central tail, black primary coverts, chestnut rump and tips of tertials and tail; mid-grey head side and neck side, becoming slightly paler on breast, lower underparts darker than on male, with only vague yellowish stain on breast side. Juvenile male has crown and nape duller, tinged brown, mantle mixed with yellowish-green feathers. Race *delacouri* male is slightly darker chestnut above than nominate.

and paler and more pearly grey on throat. **VOICE.** Song in W Myanmar a full, rather mellow, plaintive “wip-wiyu” with slightly stressed terminal syllable, repeated at intervals of 2–5 seconds; in Nepal very similar but with longer pause after first note, “wip wu-yu” (repeated after 1–3 seconds), and another song type recorded in Nepal a more evenly spaced, slightly descending “yu-wu-uu” (repeated after 2–4 seconds); song also described as a loud, sweet, brief rich whistled “dit-du-whéuu”, first 2 notes staccato and subdued, third stressed and rapidly slurred up and down. Two types of call recorded: a curious, quick, nervous, tremulous “ukuk-wrrrri-yiwu”, first note low and throaty, second long and high-pitched (repeated after short intervals), and harsh, scolding, gruff “rrrr-rrrr-rrrr-rrrr-rrrr...” (5–7 notes) when agitated.

**Habitat.** Broadleaf evergreen forest, including mature mixed moss-covered oak and mixed oak-rhododendron, occasionally secondary growth and bamboo. In Indian Subcontinent found at 2135–2500 m, occasionally up to 3230 m in Nepal and down to 1830 m in India; 1600–2400 m in Bhutan, where occurrence dictated by presence of mature undisturbed forest; in Myanmar, recorded at 1525–2650 m (once down to 1220 m) in winter but only above 2530 m in summer; at similar elevations in China and Vietnam.

**Food and Feeding.** Insects, including weevils and other beetles (Coleoptea) and caterpillars. Occurs singly, in pairs or in small parties (commonly singly in Bhutan), sometimes in association with other species, including other babblers, in mixed feeding flocks. Lethargic and rather slow-moving. Forages usually quite high up in trees, in canopy and upper middle storey, but sometimes quite low down in undergrowth. Searches mossy branches. Habits similar to those of *P. flaviscapis*.

**Breeding.** Season Apr in Bhutan. No other information.

**Movements.** Resident; some possible seasonal elevational movements.

**Status and Conservation.** Not globally threatened. Scarce to locally frequent from C Nepal E to NE India, where present in Buxa Tiger Reserve, in West Bengal, and Eaglenest Wildlife Sanctuary, in Arunachal Pradesh; uncommon in Bhutan, where found mainly in E valleys, and present in Thrumshingla National Park. Scarce to uncommon in Myanmar, where scarce in Natmoutaung National Park. Scarce in China and Vietnam.

**Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Bishop (1999), Cheng Tsohsin (1987), Choudhury (2000, 2003), Delacour & Jabouille (1931a), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), King, Buck *et al.* (2001), King, Dickinson & Woodcock (1975), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952, 1982), Robson (2000), Robson *et al.* (1998), Rothschild (1926), Smythies (1986), Spierenburg (2005), Stanford & Mayr (1941), Stevens (1923), Stresemann & Heinrich (1940a), Thet Zaw Naing (2003).

#### 298. White-browed Shrike-babbler

##### *Pteruthius flaviscapis*

**French:** Alouette à sourcils blancs **Spanish:** Timali-alcaudón Cejiblanco  
**German:** Weißbrauen-Würgertimalie  
**Other common names:** Red-winged/Black-crowned Shrike-babbler, Greater Shrike-babbler

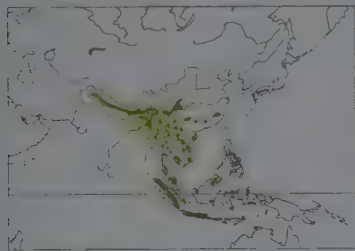


**Taxonomy.** *Allotrius flaviscapis* Temminck, 1836. Java.

Relationships of genus uncertain; most of recent studies suggest that it does not belong in current family, and recent molecular analyses indicate that it should be placed in the New World family Vireonidae. Proposed race *ripleyi* (from Pakistan E to W Nepal) treated as a synonym of *validirostris*, and *lingshuiensis* (Hainan) synonymized with *ricketti*. Populations in Peninsular Malaysia currently included in race *cameranoi*, but are in fact intermediate between that taxon and *schaenseei*. Individuals of this species recorded in SW, NE & SE Thailand, SW Cambodia, S Laos and C Vietnam (C Annam) have apparently not been assigned to race. Eight subspecies recognized.

**Subspecies and Distribution.**

*P. f. validirostris* Koelz, 1951 – NE Pakistan E in W Himalayas to Bhutan and all NE Indian hill states, adjacent S China (SE Xizang) and NW & W Myanmar.  
*P. f. ricketti* Ogilvie-Grant, 1904 – NE Myanmar, S & SE China (WC Sichuan S to W & NW Yunnan and E to N Fujian, also Hainan), N Thailand and N Indochina.  
*P. f. aeralatus* Blyth, 1855 – E & SE Myanmar (including N Tenasserim) and NW & W Thailand.  
*P. f. annamensis* Robinson & Kloss, 1919 – S Vietnam (S Annam) and adjacent extreme E Cambodia.  
*P. f. schauenseei* Deignan, 1946 – S Thailand.  
*P. f. cameranoi* Salvadori, 1879 – Peninsular Malaysia and Sumatra.  
*P. f. robinsoni* Chasen & Kloss, 1931 – Borneo.  
*P. f. flaviscapis* (Temminck, 1836) – Java.



**Descriptive notes.** 14 cm; 29–44 g. Medium-sized shrike-babbler with chestnut on tertials, male black-crowned and white below, with bold white rear supercilium and grey upperparts, female grey on head and with green fringes on wings and tail. Male nominate race has crown, lores, cheek and ear-coverts black, broad postocular supercilium white, upperparts mid-grey, rump greyer, upwearing and tail black with bluish gloss, tertials yellow with chestnut inner webs and tips, inner flight-feathers tipped white; throat, submoustachial area and underparts greyish-white, very vague pale greyish-buff tinge on flanks and lower belly;

iris bluish, grey, brown or chestnut; upper mandible mostly blackish, lower mandible pale bluish-slate; legs dark flesh to pale grey. Female has dull olive-grey head with vague whitish postocular supercilium, brownish olive-grey mask with whitish shaft streaks, dull olive-grey upperparts, dull olive-yellow wing fringing and tail, buffy-white underparts with olive wash on lower flanks. Juvenile male has crown grey-tinged yellowish-brown, cheeks and ear-coverts dark grey, mantle olive-brown, wing-coverts edged yellowish-white, tail tips yellow; juvenile female has head grey-brown (as mantle), ear-coverts dark slate-grey. Races vary considerably in plumage details of both sexes: *validirostris* male has tertials all dark chestnut and pinkish-brown tinge on lower flanks, female with distinct grey on crown and white postocular supercilium; *ricketti* male has ear-coverts slate-grey, shading to smoky-grey throat and breast, with flanks as previous, tertials chestnut with yellow on bases and outer webs, and with black tips (juvenile male upperparts olive-grey, crown feathers olive-grey with white shafts), female with reduced chestnut in tertials; *aeralatus* male has ear-coverts black and underparts pale grey with whiter submoustachial line, tertials and flanks as last race, female with chestnut in tertials reduced to tips; *annamensis* male is similar to previous but slightly darker grey above and paler below (thus lacks indistinct white submoustachial), no black tips on tertials (juvenile male head greyer with pale streaks, ear-coverts dusky with pale streaks, postocular supercilium less distinct, broad yellow tips on wing-coverts, breast washed buffy, undertail-coverts pale lemon-yellow), female is less buffy below, tertials much more extensively chestnut, both sexes with smaller white tips on primaries; *schaenseei* is also similar, but shorter-winged, female with little or no chestnut on tertials; *cameranoi* male is again like *aeralatus* but a tone darker above and below, females very similar; *robinsoni* is mid-way in size between nominate and continental races, male with relatively strong pinkish wash on flanks. Voice. Sings with repeated loud strident rhythmic series of notes with short weak introduction, subject to considerable (probably regional/subspecific) variation: in W Myanmar and NW Thailand “ip ch-chu ch-chu” or “itu chi-chu chi-chu”, in Peninsular Malaysia “ip chip chip ch-chip”, in S Annam (Vietnam) “ip chu ch-chu”, in Borneo “cha-chew, cha-chew” or “cha-cha-chip, cha-cha-chip” or “chu-wip-chip-chip”. Calls include short “pink”, and grating churring sounds when alarmed.

**Habitat.** Broadleaf evergreen forest, oak-rhododendron forest, coniferous forest, montane ericaceous vegetation; in Laos also in *Fokienia*-dominated forest. Found at 900–2700 m; locally down to 300 m (perhaps in winter only), in Indian Subcontinent; 2000–2135 m in Xizang and 350–3050 m elsewhere in China; 700–2500 m in mainland SE Asia; 950–2700 m in Sumatra, 1000–3000 m in Java and 750–3100 m in Borneo.

**Food and Feeding.** Insects, including grasshoppers and locustids (Orthoptera), moths and caterpillars (Lepidoptera) and beetles (Coleoptera); also berries, fruits and seeds. Found singly, in pairs or in small parties of 6–15 individuals, regularly associating with other species, including larger babblers, in mixed flocks. Forages slowly and methodically, mostly in higher canopy, working way up tree towards top, shuffling sideways along branches; inspects moss and lichen, searches mainly on main branches for insects and berries. Not shy; sometimes aggressive towards other species.

**Breeding.** Apr–Jun in India, Myanmar and China; song in Bhutan Apr–Jul; Jan–Apr in Thailand and S Annam, Apr in Laos and May–Jun in Peninsular Malaysia; breeding-condition birds in Mar in N Borneo (Sabah). Nest a loose but strong cradle or shallow cup, made of rootlets, fibres, tendrils and a few twigs, coated on outside with moss and lichen, plastered with cobweb, lined with rootlets, and suspended 4–6–13 m above ground from horizontal fork of branch of tree (including pine). Clutch 2–5 eggs (usually 3 in Myanmar, 4–5 in S China), whitish, pinkish-white or lilac-white, profusely marked with tiny flecks and spots of deep purple/purple-brown over markings of greyish and lilac; nestlings fed by both sexes. No other information.

**Movements.** Resident; seasonal altitudinal displacements in Bhutan and elsewhere in Himalayas, descending in Oct and moving upslope Apr.

**Status and Conservation.** Not globally threatened. Commonest shrike-babbler. In Pakistan, fairly common in Murree Hills but otherwise rare and local. Fairly common in Nepal. Common in temperate zone in Bhutan; near Zhemgang, density of 3–9 territories/km of road at 1600–1900 m, making it one of commonest forest birds at these elevations; present in Thrumshingla National Park. Frequent in India, where uncommon in Dehra Dun valley (Uttaranchal) and uncommon (found in oak forest) in Majhatal Harsang Wildlife Sanctuary (Himachal Pradesh); present in Buxa Tiger Reserve (West Bengal) and in Eaglenest Wildlife Sanctuary and Mouling National Park (both Arunachal Pradesh). Very common in Thailand. Locally common in China, where recently re-

corded in eight (15%) of 54 sites surveyed (of which 52 are nature reserves), including Shiwandashan National Reserve (where rare, at best) and Diding Nature Reserve (where uncommon), in Guangxi. In Laos, frequent in Dong Hua Sao National Biodiversity Conservation Area (NBCA), common above 1000 m in Nakai-Nam Theun NBCA and present in Phou Dendin NBCA. In Vietnam, present in Ba Be National Park and Na Hang Nature Reserve, in N, in four protected areas in the Annamese lowlands, and in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam; in last-mentioned area, estimated density of 0.22 birds/ha, yielding population estimate for reserve of 4330 individuals. Common in Peninsular Malaysia. Common in Aceh, Utara and Selatan, in Sumatra, where present in Gunung Leuser National Park. Uncommon but fairly widespread in Java; uncommon in Gunung Gede-Pangrango National Park, in W of island. Locally fairly common to common in N & C Borneo, albeit uncommon in Sabah, and present in Kayan Mentarang National Park, in E Kalimantan, and in Gunung Niut Nature Reserve, in W Kalimantan. **Bibliography.** Ali & Ripley (1972), Allen *et al.* (1997), Andrew (1985), Anon. (2004c), Bangs (1921), Birand & Pawar (2004), Buij *et al.* (2006), Caldwell & Caldwell (1931), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Choudhury (2003), David-Beaulieu (1944), Davison (1992, 1997a), Deignan (1963), Delacour & Jabouille (1931a), Duckworth & Hedges (1998), Duckworth *et al.* (1998), Eames (1995), Eames *et al.* (2001), Evans & Timmins (1998), Grimmett *et al.* (1998), Hill (2000), Hill *et al.* (2001), Holmes (1997), Hoogerwerf (1950a), Huang Qiang *et al.* (1995), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Koelz (1954), La Touche (1923, 1925–1930), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Li Guiyuan *et al.* (1994), Ludlow (1951), Ludlow & Kinnear (1937, 1944), MacKinnon (1988), van Marle & Voous (1988), Martens & Eck (1995), Medway & Wells (1976), Meyer de Schauensee (1946, 1984), Mishra (1997), Priemé & Heegaard (1988), Rasmussen & Anderton (2005), Reddy (2005), Ripley (1952), Robbins *et al.* (2006), Robinson (1928), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a, 1993b), Robson, Eames, Wolstencroft *et al.* (1989), Rothschild (1926), Round (1999), Sheldon *et al.* (2001), Singh (2000), Smythies (1986), Smythies & Davison (1999), Sody (1956), Spierenburg (2005), Stanford & Ticehurst (1938), Stevens (1923), Stresemann & Heinrich (1940a), Thewlis *et al.* (1996), Tymstra (1993), Wu Zhikang *et al.* (1986), Yen Kwokying (1934a), Zhang Quntan *et al.* (1994), Zheng Zuoxin *et al.* (1983).

## 299. Green Shrike-babbler

### *Pteruthius xanthochlorus*

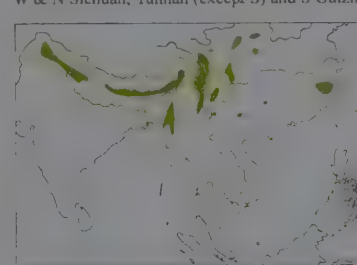
**French:** Allotrie verte **German:** Vireowürgerimalie **Spanish:** Timali-alcaudón Verde

**Taxonomy.** *Pteruthius xanthochlorus* J. E. Gray and G. R. Gray, 1847. Nepal.

Relationships of genus uncertain; most of recent studies suggest that it does not belong in current family, and recent molecular analyses indicate that it should be placed in the New World family Vireonidae. Four subspecies recognized.

**Subspecies and Distribution.**

*P. x. occidentalis* Harington, 1913 – W Himalayas from NE Pakistan E to W Nepal.  
*P. x. xanthochlorus* J. E. Gray & G. R. Gray, 1847 – C Nepal E to Bhutan, NE India (C Arunachal Pradesh) and adjacent S China (SE Xizang).  
*P. x. hybrida* Harington, 1913 – NE India (Nagaland S to Mizoram) and W Myanmar.  
*P. x. pallidus* (David, 1871) – N Myanmar, and SC & SE China from SE Gansu and S Shaanxi S to W & N Sichuan, Yunnan (except S) and S Guizhou, and S Zhejiang and N Fujian.



**Descriptive notes.** 12–13 cm; 14–15 g. Small shrike-babbler with relatively small bill, greyish head, olive upperparts, whitish-grey throat and breast and pale yellow belly. Male nominate race has forehead to nape slaty mid-grey, sometimes with sootier smudge on hindcrown, upperparts drab olive-green; upwearing blackish, outer fringes as upperparts, narrow whitish bar along tips of greater coverts, blackish primary coverts; tail as upperparts, but outer feathers blackish distally and with narrow white tips; lores, cheek and ear-coverts mid-grey, mixed with olive on ear-coverts, throat and underparts whitish, yellowish-olive wash on lower throat side, behind ear-coverts and along flanks; iris dark brown to grey; bill dark horn, blue-grey on lower mandible; legs flesh-grey or brown to smoky brown. Female resembles male but has paler grey crown. Juvenile has underparts duller, more olive-brown than adult, grey of head and face not contrasting with upperparts. Race *occidentalis* has ashy-grey crown and nape and greyer upperparts than nominate; *pallidus* is like previous, but crown colour extends onto mantle, has white eyering, flanks and vent much brighter yellowish-green, wing fringes grey (not green), juvenile male resembles female; *hybrida* is like nominate, but with white eyering. Voice. Song a monotonous, fairly high-pitched series, repeated every 2–8 seconds, variable, a fairly well-spaced “whitu-whitu-wheel”, “wheel-wheel-wheel” and “chuiwi-chuiwi”, or well-spaced “chiev-chiev...” (2–4 notes), or faster, slightly tremulous “whitwhitwhitwhit...” (4–6 notes), or fairly fast, shorter (4–5 notes) “whiwhiwhiwhi...”, also rather fast “chiwichiwichiwichi...” (4–5 notes). Songs sweeter, more slurred and piercing, less metallic and chirpy, than those of *P. melanotis* and *P. aenobarbus*. Calls include a nasal wheezy “nyeeep, nyeeep”, “jerr”, “jerr-jerr”, “jer-ri” and higher “jerri”, as well as soft “ik”, “uk” and “jep” contact notes.

**Habitat.** Temperate broadleaf and conifer forest, e.g. oak and mixed oak-rhododendron forest, mixed broadleaf-coniferous forest. Found at 210–3600 m in Indian Subcontinent and SE Xizang, sometimes descending to 1200 m in winter, rarely to 700 m in Bhutan; in SC & E China recorded at 900–3600 m, some descending to 760 m in winter; 1700–2800 m in Myanmar.

**Food and Feeding.** Ants (Formicidae), beetles (Coleoptera) and other insects; also berries and seeds. Found singly, in pairs or in small groups of up to four individuals, often in association with mixed-species flocks, including tits (Paridae), *Phylloscopus* leaf-warblers and other babblers. Strictly arboreal, as congeners; behaviour sluggish, and reminiscent of that of North American vireos (*Vireo*).

**Breeding.** Apr–Aug throughout range. Nest a flimsy, deep purse or cradle, made of fine root fibres and hair-like lichen or moss, bound together with cobweb, lined with rootlets or black wool, outwardly decorated with a few flakes of lichen, and suspended 1.5–8 m above ground with cobwebs, hammock-like, from fork of small outer branch of tree. Clutch 2–4 eggs, cream with red-brown blotches. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Rare and very local in Pakistan, including Palas Valley, in North-West Frontier Province. Uncommon to locally common in NW Indian Himalayas SE to W Nepal; significant proportion of world population judged to be in Shey-Phoksundo



including in Guiting County Guangxi (China) (Zhang et al. 1987). Other records include: Hong Kong (Mingren 1960), India (Srinivasan & Srinivasan 1972), Iran (Nasr 1972), Israel (Graham 1972), Japan (Hirakawa 1972), Korea (Lee 1972), Laos (Cheng Tsochia 1987), Davidson et al. (1997), Mongolia (Ali & Ripley 1972), Andrew (1985), Anon. (2004), Argentina (Tschida 1987), Australia (Jennings 1963), Delacour & Jabouille (1931a), Duckworth et al. (1998), Farnes (1995), Farnes et al. (2001), Evans & Timmins (1998), Grimmer et al. (1998), Koez (1954), Lee Kwai Sing et al. (2006), Legaki & Kynd (1991), MacKinnon (1988), van Marle & Vogus (1988), Meyer de Schauensee (1946, 1984), Rasmussen & Anderson (2005), Robson (2000), Robson et al. (1993a, 1993b), Round (1999), Smythes (1986), Sody (1956), Thewlis et al. (1996), Timmins & Trinh Viet Cuong (1999), Vordeman (1895), Yen Kwokying (1934a).

PLATE 24





PLATE 24

## PLATE 24

## Family TIMALIIDAE (BABBLERS) SPECIES ACCOUNTS

### Genus *ERPORNIS* Hodgson, 1844

#### 302. White-bellied Erpornis

##### *Erpornis zantholeuca*

French: Erpornis à ventre blanc German: Grünrückenerpornis Spanish: Yuhina Ventriblanca  
Other common names: White-bellied Yuhina

**Taxonomy.** *Erpornis* [zantholeuca] Blyth, 1844. Nepal.

Affinities uncertain. Formerly treated in genus *Yuhina*, and has been placed in *Stachyris*, but molecular evidence supports long-held suspicion that no relationship exists with either of those; moreover, recent studies suggest that this species belongs outside current family, and possibly with the New World vireos (Vireonidae). Geographical variation trivial, and some named races considered untenable; thus, *griseilioris* (from SE Yunnan and Guizhou E to Taiwan) is synonymized with *tyrannulus*, and *sordida* (E Thailand and S Indochina) and *interposita* (Peninsular Malaysia) with nominate. Five subspecies recognized.

##### **Subspecies and Distribution.**

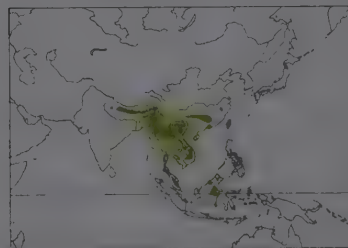
*E. z. zantholeuca* Blyth, 1844 – Nepal, Bhutan, all NF Indian states, E Bangladesh, S China (W & N Yunnan), and throughout SE Asia (except for N & SE Thailand and N Indochina).

*E. z. tyrannulus* (Swinhoe, 1870) – SE China (SE Yunnan and S Guizhou E to Jiangxi and Fujian, including Hainan and Hong Kong), Taiwan, N Thailand and N Indochina.

*E. z. canescens* Delacour & Jabouille, 1928 – SE Thailand and SW Cambodia.

*E. z. saani* Chasen, 1939 – NW Sumatra.

*E. z. brunescens* (Sharpe, 1876) – Borneo, including Pulau Laut (off SE coast).



**Descriptive notes.** 11–13 cm; 8–17 g. Small passerine resembling a yuhina, yellowish-green above and greyish-white with yellow vent below, with short crest, squared-off tail, and mostly pale, sharp, slender bill with tip slightly bent over, and rather short and dainty legs. Nominant race has crown (with slightly elongate feathers), upperparts and tail yellowish-green, upperwing fringed yellowish-green; lores greyish-green, this colour extending vaguely over eye, cheek and ear-coverts pale silvery grey; underside greyish-white, whitest on central area from chin to belly, vent pale yellow; iris grey, chestnut, ruby-red or dark brown; bill pinkish, culmen brown; legs greyish-rosy to whitish-flesh. Sexes similar. Juvenile is duller than adult, upperparts and secondaries with brownish cast. Race *tyrannulus* is greener above and greyer below than nominate; *canescens* has faint greyish wash on crown and upper mantle; *brunescens* is like nominate but duller, slightly brownish-tinted, particularly above; *saani* resembles last, but upperparts greener, not so yellow, crown darker. Voice. Song a short high-pitched descending trill, “si-ti-ti-ti”, or rising and falling “ss-sss-sse-se-se”, or only rising and with rapid delivery (trilled), “chechecheche”. Typical calls loud peevish nasal “nher-nher” or “jeeer-jeeer-jeeer” notes, interspersed with chirring notes and dry trills; also “hihi” notes, call of foraging individual in Taiwan a rapid rising quiet tinkle, “didi-didi”, lasting c. 0.5 seconds.

**Habitat.** Broadleaf evergreen forest, secondary growth, selectively logged forest, light deciduous forest, mixed broadleaf-pine forest, moss forest, bamboo, also upland heath and overgrown rubber in N Borneo (Sabah). Found at 180–2300 m, rarely to 2400 m, in Indian Subcontinent, once 3650 m in Bhutan; 360–1150 m in China but 1525–3300 m in Taiwan, some possibly descending a little in winter (although limits in N Taiwan given as 50–1850 m); up to 2650 m in SE Asia, 550–1100 m in Sumatra and to 1700 m in Borneo.

**Food and Feeding.** Small grasshoppers and bush-crickets (Orthoptera), and other insects and their larvae, particularly small caterpillars; also berries, soft figs and flower nectar, occasionally seeds. Less gregarious than other yuhinas. Found singly all year, but also in pairs or small parties, and often in company with mixed flocks of warblers (Sylviidae) and other small babblers (e.g. minlas). Frequents lower canopy and higher bushes, in middle storey. Often hangs upside-down in manner of a tit (Paridae).

**Breeding.** Mar–Jun in Indian Subcontinent and Jan–Aug in SE Asia; birds in breeding condition Jan–May, Oct and Dec and dependent juvenile Aug and Dec in Borneo. Nest, built by both sexes, a small, deep cradle made of fine grass stems, moss, rootlets, small dry leaves, finely shredded brown or other fibres, sometimes plentifully compacted with cobweb, lined with fine dark leaf stems, fine grasses and whitish fibres, suspended 0.5–2 m above ground (sometimes up to 5.5 m) between horizontal twigs of tree, bamboo or shrub. Clutch 2–3 eggs in India, Myanmar and Peninsular Malaysia, white, creamy white or with faint pink tinge, thinly marked with speckles and blotches of pale pinkish-red or pale red-brown. No other information.

**Movements.** Resident. In Taiwan, higher elevations usually visited only in post-breeding dispersal period. Reports of local seasonal movements (e.g. in India, regarded as regular winter visitor in Nameri National Park and local migrant to Kaziranga National Park, in Assam) improbable and require substantiation.

**Status and Conservation.** Not globally threatened. Locally fairly common to common in SW, C & E Nepal. Relatively uncommon but fairly widespread in Bhutan, where present in Thrumshingla National Park. Locally fairly common in India, but scarce or rare in hills of Assam; in NE India, present in Buxa Tiger Reserve (West Bengal), with 12 birds/km<sup>2</sup> in hill forest, and in (at least) Eaglenest Wildlife Sanctuary and Nandapha and Mouling National Parks (Arunachal Pradesh), Balphakram National Park, in Meghalaya, Nameri National Park and Barail Reserve Forest, in Assam, and Ngengpui Wildlife Sanctuary and Dampa Tiger Sanctuary, in Mizoram. Locally common in SE Bangladesh. Fairly common or locally common and widespread in S China, where recently recorded at 31 (57%) of 54 sites surveyed (of which 52 are protected areas), including Shiwandashan National Nature Reserve (where rare) and Diding Nature Reserve (where common), in Guangxi. Uncommon to common in Taiwan. Scarce and localized in Hong Kong, but spreading and increasing in numbers following colonization c. 1980. Generally common in SE Asian range. Uncommon throughout Myanmar, but very common in Thailand. In Laos, common and/or present in Xe Pian National Biodiversity Conservation Area (NBCA), and in Phou Xang He, Phou Dendin, Dong Hua Sao, Xe Bang Nouan, Nakai-Nam Thuen, Hin Namno, Nam Kading, Phou Khaokhoay and Phou Xiang Thong NBCAs. In Vietnam, present in Ba Be National Park and Na Hang Nature Reserve, in N, and in Thuong Da Nhim and Chu Yang Sin Nature Reserves (Da Lat Plateau), in S Annam, and in twelve protected areas in the Annamese Lowlands EBA. Rare in Aceh, in Sumatra, where race *suani* known from one specimen and three other records, two in Gunung Leuser National Park. Uncommon generally in Borneo, but common in N (Sabah); present in Similajau National Park, in Sarawak.

**Bibliography.** Ali & Ripley (1948, 1971), Allen *et al.* (1997), Anon. (2004c), Barua & Sharma (1999, 2005), Birand & Pawar (2004), Buij *et al.* (2006), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chasen (1939), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Cheng Tsohsin & Cheng Paolai (1962), Choudhury (2003), David-Beaulieu (1932, 1939, 1944, 1950), Davidson (1998), Davidson *et al.* (1997), Davison (1997b), Deignan (1963), Delacour & Jabouille (1931a), Duckworth & Hedges (1998), Duckworth & Kelsh (1988), Duckworth, Tizard *et al.* (1998), Duckworth, Wilkinson *et al.* (1997), Eames (1995), Eames, Eve & Tordoff (2001), Eames, Steinheimer & Ros Bansok (2002), Engelbach (1932), Evans & Timmins (1998), Evans *et al.* (2000), Grimmett *et al.* (1998), Hachisuka & Udagawa (1950, 1951), Hill (2000), Holmes (1996, 1997), Hume (1880), Hume & Davidson (1878), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Johns (1989), Katti *et al.* (1992), King & Han Lianxian (1991), King & Liao Weiping (1989), Koh Chaonien & Lee Peifen (2003), La Touche (1923, 1925–1930), Lê Manh Hùng *et al.* (2002), Lê Xuân Canh *et al.* (1997), Lee Kwok Shing *et al.* (2006), Lekagul & Round (1991), Lewthwaite (1996), Ludlow & Kinnear (1944), van Marle & Voous (1988), Mayr (1938), Medway & Wells (1976), Meyer de Schauensee (1984), Neath (2001), Nguyễn Duc Tu *et al.* (2001), Rasmussen & Anderton (2005), Rheindt (2004), Robbins *et al.* (2006), Robinson (1928), Robinson & Kloss (1919a), Robson (2000), Robson, Eames, Nguyễn Cu & Truong Van La (1993a), Robson, Eames, Wolstencroft *et al.* (1989), Sharpe (1889), Sheldon *et al.* (2001), Showler, Davidson, Chanthavi Vongkhamheng & Khounmee Salivong (1998), Showler, Davidson, Khounmee Salivong & Khannkhoun Khounboline (1998), Singh, A.P. (2000), Singh, P. (1995), Sivakumar *et al.* (2006), Smith *et al.* (1940, 1943), Smythies (1986), Smythies & Davison (1999), Spierenburg (2005), Stanford & Mayr (1941), Stanford & Ticehurst (1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1893), Thewlis *et al.* (1996), Thompson (1966), Ticehurst (1933), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997), Tordoff *et al.* (2002), Wiles (1980), Wilkinson, Dutton & Sheldon (1991), Wilkinson, Dutton, Sheldon, Darjono & Noor (1991), Wu Zhikang *et al.* (1986), Yen Chungwei (1990).

## Genus *KAKAMEGA* Mann *et al.*, 1978

### 303. Grey-chested Kakamega

#### *Kakamega poliothorax*

**French:** Kakamega à poitrine grise

**Spanish:** Tordina de Kakamega

**German:** Graubrust-Drosseltimalie

**Other common names:** Grey-chested Akalat/Illadopsis/Babbler/Thrush-babbler

**Taxonomy.** *Alethe poliothorax* Reichenow, 1900, Bangwa (c. 5°15' N 10°25' E). Cameroon. Affinities uncertain. Has been placed in genus *Malacocincla*, and possibly belongs in *Modulatrix*; recent molecular research indicates possible relationship with the sugarbirds (Promeropidae), whereas some evidence suggests that it may belong in the thrush family (Turdidae). More study needed. Despite fragmented distribution, geographical variation virtually non-existent. Monotypic. **Distribution.** SE Nigeria, W Cameroon and Bioko I (Fernando Póo); E DR Congo, W Uganda, SW Rwanda, W Burundi and W Kenya.



**Descriptive notes.** 16.5 cm; 30–42 g. Thrush-like passerine, reddish-brown above, grey and white below, with rather long stout legs; very shy. Crown and forehead are dark rufous-brown with thin pale mottling, lores dark, head side (superciliary area, cheek, ear-coverts and neck side), upperparts and upperwing rich reddish-brown, slightly darker chestnut tail; chin, submoustachial area and throat off-white with grey mottling, upper breast and flanks grey, lower breast paler and shading to whitish on lower belly, with grey thighs and vent; iris reddish-brown; upper mandible black, lower mandible slate-grey; legs slate-blue. Sexes similar.

Juvenile has more blackish-grey head than adult and duller, more gingery upperparts, more olive-brown breastband, iris brown. **VOICE** Song, from low in vegetation and singly (sometimes within a group, but not in chorus), a loud, clear, melodious whistling, almost like that of Old World oriole (*Oriolus*) in quality, repeated several times before switching to another combination of notes, “pyoo-pyoo-tseewo” or “pyaw-pyaw-pyoo-pyi”, rather monotone but with loud and soft notes often alternating (“pée-patyée-patyóó”), sometimes longer, sometimes more rapid with bubbling quality, “trilutruleo”; described also as an attractive rising and falling fluty “t’iyew-t-t’chloo”. Has warbling call, “chee-cheerlee-cheerlee-chii-chee-cher-chii-ri-uu”, last note trilled, and loud “chee-wee, chee-wee, chee-wee, chee-wee...”, explosive “chichichichi” and liquid “tuituituituituit” calls, a thrush-like “chirp”, also a harsh chattering alarm, “kertakertaker” or “shrank-shrank”.

**Habitat.** Mature and secondary montane forest, especially near streams, also (DR Congo) transition forest and high-elevation gallery forest; in Rwanda, only in shady forest, especially by streamsides, in damp hollows and on slopes with Acanthaceae and tree-ferns. At 700–2200 m in Cameroon; 1830 m on Bioko; 1525–2440 m in DR Congo, and 2135–2440 m in Uganda.

**Food and Feeding.** Invertebrates. Usually found singly or in pairs, on or near ground. Turns over dead leaves and creeps about quietly and unobtrusively in thick undergrowth. Often follows swarms of army ants (*Dorylus*), then associating with other species in mixed flocks; occasionally comes into more open areas at such times.

**Breeding.** Breeding-condition birds in Apr and Nov in Cameroon and Jan–Feb and April in DR Congo; increase in singing intensity and alarm-calling in Oct in Rwanda; birds with brood patches in Aug–Sept in Uganda. Nest a deep cup made of leaves and moss, placed on ground in hollow under fallen tree. Clutch 2 eggs, “whitish”. No other information.

**Movements.** Resident; record at 580 m on Mt Cameroon may have involved an elevational migrant. **Status and Conservation.** Not globally threatened. Generally uncommon to rare, but locally common. Common in SE Nigeria; widespread and generally uncommon in W Cameroon. Uncommon to fairly rare in E DR Congo; present in Nyungwe Forest Reserve, in Rwanda, and Bururi Forest Nature Reserve, in Burundi; fairly common at Ruhija in Bwindi-Impenetrable National Park, in Uganda, and present in Ruwenzori National Park. Local and scarce in Kakamega Nature Reserve and North and South Nandi Forest Reserves, in Kenya, and now extinct on Mt Elgon and Lerundo.

**Bibliography.** Bannerman (1953), Borror & Demey (2001), Britton (1980), Carswell *et al.* (2005), Chapin (1953), Dowsett-Lemaire (1990), Elgood *et al.* (1994), Fry *et al.* (2000), Holyoak & Seddon (1990), Lewis & Pomeroi (1989), Louette (1981), Mann (1980, 1985), Mann *et al.* (1978), Stevenson & Fanshawe (2002), Stuart (1986), Williams & Arlott (1980), Willis (1983), Zimmerman *et al.* (1996).

## Genus *MODULATRIX* Ripley, 1952

### 304. Spot-throat

#### *Modulatrix stictigula*

**French:** Modulatrice à lunettes

**German:** Fleckenkehltimalie

**Spanish:** Tordina de Anteojos

**Taxonomy.** *Turdinus stictigula* Reichenow, 1906, Mbaramo, Usambara, Tanzania. Affinities uncertain. Thought not to be long in present family; has been considered to belong with the bulbuls (Pycnonotidae) or the thrushes (Turdidae), but recent molecular studies suggest that it is closest to the sugarbirds (Promeropidae). Further research needed. Proposed race *pressa* (from S of range) considered undiagnosable, as characters on which it was based (and others, more recently used) are not apparent in large series of specimens. Treated as monotypic. **Distribution.** Mountains of E & S Tanzania (S from Usambaras and Nguru Mts, in NE) and extreme N Malawi.



**Descriptive notes.** 15–17 cm. Dark brown babbler-like passerine with dull rufous breast and dark-mottled buffy throat; restless but shy. Crown and upperparts are dark rufescent olive-brown, upperwing with chestnut fringes, tail chocolate-chestnut; lores deep chestnut-brown, cheek and ear-coverts the same with tiny buff shaft streaks; chin, submoustachial area and throat buffy-tan with blackish tips, lower neck side and breast to belly shiny rufous-tan, shading buffier on mid-belly and olive-chestnut on flanks and thighs, vent dull rufous; iris dark brown, off-white evering; upper mandible blackish, lower mandible grey-brown; legs dark brown. Sexes similar. Juvenile is slightly paler below, throat less mottled than adult. **VOICE.** Song a loud, shrill, slurred whistling with some long higher notes, varying greatly regionally and individually, e.g. “skureet chirreet siureeeet sreet see sheeu-tsi-chiu, seceeeet, swee-ir-si-rééó”, final note loudest, or “eit, seeyee, heet, eeree, reeze, peeyer”; also a shorter “chiu chi-chi-chééó” and shrill, descending “siuuuu”, repeated several times. Alarm call a hard 3-note “jeir jeir jeir” or “chew churri”.



**Habitat.** Montane forest, including dense high-elevation thickets, locally also degraded forest (although in E Usambaras degraded forest apparently unsuitable); also undergrowth and shrubbery at forest edge, gardens. At 900–2700 m, mainly above 1200 m; mid-altitude wet luxuriant forest and drier forest at higher elevations in Ndundulu; 1750–2000 m, commoner above 1800 m, in Malawi.

**Food and Feeding.** Insects and berries reported. Probes in leaf litter and flicks leaves with bill; runs along forest floor or hops, with tail held slightly elevated. Solitary, in pairs or in (probably family) groups of 3–4 individuals. Sometimes attends ant columns.

**Breeding.** Birds in breeding condition in Oct–Mar (peak Nov–Dec) in Tanzania; peak in singing Feb–Mar in Malawi. Nest in one case a neat cup of twigs lined with felt of leaf skeletons, placed 1–6 m above ground in fork of forest sapling. Clutch 2 eggs, pinkish with heavy crimson blotches and scrawls. No other information.

**Movements.** Resident; Dec record at 600 m in dry bushland suggests some altitudinal movement.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Tanzania–Malawi Mountains EBA. Uncommon to abundant, and especially numerous at higher elevations. Common in Ndundulu Mts in both wet and drier forests, and in the Udzungwa National Park as many as 74 pairs/km<sup>2</sup>. In E Usambaras, the Nilo Forest Reserve holds a high density of this species and may be of particular importance. Density of 1 singing bird/ha in Malawi, where species present in Wilindi-Matipa Forest Reserve.

**Bibliography.** Britton (1980), Dinesen *et al.* (1993), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (1983, 2006), Keith *et al.* (1992), Moyer (1993), Ripley & Heinrich (1969), Slater & Moreau (1932), Seddon *et al.* (1999a, 1999b), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

Jensen & Stuart (1982), Keith *et al.* (1992), Moreau & Moreau (1937), Moyer (1993), Newmark (1991), Ryan *et al.* (1999), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart & Hutton (1977), Stuart & Jensen (1981), Vincent (1935), van der Willigen & Lovett (1981), Zimmerman *et al.* (1996).

## Genus *ACHAETOPS* Roberts, 1922

### 306. Rockrunner

#### *Achaetops pycnopygius*

**French:** Achetopse à flancs roux **German:** Klippensänger **Spanish:** Saltarrocas de Damara  
**Other common names:** Damara Rockjumper

**Taxonomy.** *Sphenoeacus pycnopygius* P. L. Slater, 1953, Omaruru River, Damaraland, Namibia. Affinities uncertain. Often placed in genus *Chaetops* on basis of similarities in osteology and habitat, but entirely distinct in behaviour and voice; possibly does not belong in present family, and has been suggested, in part on basis of molecular evidence, that placement closer to sylviid genus *Sphenoeacus* more appropriate (although familial affinity of latter open to question). Further research required. Two subspecies recognized.

#### **Subspecies and Distribution.**

*A. p. pycnopygius* (P. L. Slater, 1953) – coastal SW Angola and N & C Namibia.  
*A. p. spadix* Clancey, 1972 – Huila and Namibe escarpment (SW Angola).



**Descriptive notes.** 16–17 cm; 24–34 g. Striking terrestrial babbler-like passerine, peppered black and white, with tawny rump and flanks and long dark tail. Male nominate race has crown to scapulars narrowly streaked buff and dark brown, diffusing on back to more vinous tints and on rump to tawny-chestnut; tail dark brown, flight-feathers dark reddish-brown with cinnamon fringes; long narrow supercilium buffy white, lores blackish, line behind eye blackish, ear-coverts dull cinnamon with white and dark streaks, narrow submoustachial stripe buffy white, narrow malar black; chin to upper belly buffy white, breast side with profuse

black spotting, lower belly to vent shading to bright tawny-rufous; iris dark brown; bill blackish, whitish base of lower mandible; legs dark grey to blackish-brown. Female is similar to male, but with more extensive tawny on belly. Juvenile is duller than adult, markings weaker, tail shorter. Race *spadix* is darker than nominate, darker on head and mantle, rump much darker, innermost tail feathers blacker. **VOICE.** Song, by both sexes at dawn and dusk, mainly in breeding season, a rich mix of clear bubbling and warbling notes, “tip tip tootle tootle ti tootle tootle too”, average duration in one case 2.2 seconds, in another 3.2 seconds, with pauses of 6–12 seconds between songs in bout; reported as sometimes mimicking other bird species. In territorial aggression a repeated soft “poew-perrit-poew”. Contact call “hoo-boy”; alarm a harsh “cheerrrrrrrr”.

**Habitat.** Sloping rocky areas, scree and outcrops with scattered thorn trees, especially along watercourses, in dry hills and mountains; rarely in trees, except when singing or calling in alarm. In Angola on rock-strewn moist grassy mountain slopes adjacent to and above escarpment forest.

**Food and Feeding.** Invertebrates, in one case apparently a small scorpion (Scorpiones); young provisioned with beetles (Coleoptera), green caterpillars (Lepidoptera) and grasshoppers (Orthoptera). Moves with tail frequently held cocked, often in open on rocks; has mouse-like running habit, and flies in laboured manner, with tail held downwards, cocked on alighting.

**Breeding.** Breeding-condition males in Dec in Angola; season Nov–Apr in Namibia. Solitary and territorial. Nest a large thick untidy structure of grass, outer rim of coarse dry blades, cup lined with fine soft grass and sometimes rootlets, well-matted entrance verandah-like; well hidden close to ground in middle of large clump of grass (e.g. *Digitaria dimeri*) or in low large-leaved shrub. Clutch 2–3 eggs, usually 3, pale pinkish-buff with dark brownish-red spots and slaty clouds; incubation period in one case 15 days; young leave nest at relatively early age, before able to fly, and hide in grass. Of five nests, three successful, each fledging 2 or 3 young (mean 2.3 per nest).

#### **Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally not uncommon in Namibia and drier coastal areas in SW Angola. Population in Namibia estimated at 96,000 individuals, of which 7500 in three protected areas, including Waterberg Plateau and Namib-Naukluft National Parks, where common. Regional population density variable, dependent mostly on elevation and rainfall; in Khomas Hochland, in C Namibia, densities higher on mica-schist than on granite slopes with less grass cover, fewer outcrops and small boulders.

**Bibliography.** Beresford *et al.* (2005), Clancey (1966, 1972a), Clinning & Tarboton (1972), Dean (2000), Fry *et al.* (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey *et al.* (2005), Jarvis & Robertson (1999), Robertson *et al.* (1995), Stattersfield *et al.* (1998).

## Genus *CHAETOPS* Swainson, 1832

### 307. Cape Rockjumper

#### *Chaetops frenatus*

**French:** Chétopse bridé **German:** Kapfelsenspringer **Spanish:** Saltarrocas del Cabo  
**Other common names:** Rufous Rockjumper

**Taxonomy.** *Malurus frenatus* Temminck, 1826, Riviersonderend Mountains, Western Cape, South Africa.

Affinities uncertain. Recent biomolecular evidence suggests that this genus, rather than being included in present family, is more closely related to the picathartes (Picathartidae), but sufficiently distinct in structure, behaviour and breeding biology to merit placement in its own separate family, Chaetopidae. Further research needed. Commonly treated as conspecific with *C. aurantius*, but

## Genus *ARCANATOR* Irwin & Clancey, 1986

### 305. Dapple-throat

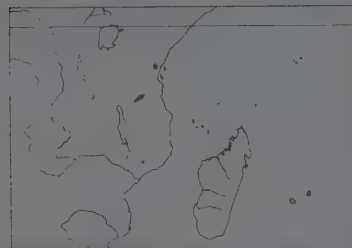
#### *Arcanator orostruthus*

**French:** Modulatrice grivelée **German:** Bülbültimalie **Spanish:** Tordina Manchada  
**Other common names:** Dappled (Mountain) Robin, Mottled Robin

**Taxonomy.** *Phyllastrephus orostruthus* Vincent, 1933, Mount Namuli, Mozambique. Affinities uncertain. Frequently placed in genus *Modulatrix*, but thought not to belong in present family; has been considered to be a bulbul (Pycnonotidae) or a chat (Turdidae), but recent molecular studies suggest that it is closest to the sugarbirds (Promeropidae). Further research needed. Three subspecies recognized.

#### **Subspecies and Distribution.**

*A. o. amani* (W. L. Slater & Moreau, 1935) – E Usambara Mts, in NE Tanzania.  
*A. o. sanjei* Jensen & Stuart, 1982 – Udzungwa Mts, in S Tanzania.  
*A. o. orostruthus* (Vincent, 1933) – Mt Namuli, in N Mozambique.



**Descriptive notes.** 17–19 cm. Dark greenish-olive babbler-like passerine with pale sulphur-tinted underparts heavily marked with soft-edged dark spots and streaks, very rounded wings. Nominative race has crown dark rufescent olive, face (lores, cheek and ear-coverts), neck side and upperparts dark olive, upperwing rufescent brown with paler fringes, tail chocolate-chestnut; chin, submoustachial area and throat pale yellowish with indistinct soft greyish-olive mottling, breast and flanks slightly stronger yellow with long, broad but soft-edged greyish-olive streaks, mid-belly pale yellowish with greyish-olive flecks, thighs and

vent unmarked pale yellow; iris brown or red-brown; bill blackish-brown, pale base of lower mandible; legs pinkish-grey. Sexes similar. Juvenile has little yellow on underparts, which appear rather uniformly olive. Race *amani* has crown, rump and flight-feathers without rufescent tinge, tail darker; *sanjei* is very like last, but has dark brownish-olive tail with minimal chestnut tinge, breast more heavily dappled, flanks more continuously dark olive, bill broader-based. **VOICE.** Song pure and pleasant but not rich, of several types, all rapidly delivered and of short, clear, melodious stanzas, sometimes like that of Old World oriole (*Oriolus*), e.g. “qu qu-we wurdilec wée-yew” or “(twee) turileá”, or “tu-tu-wéetaloo, tu-tu-wéetaloo”, or “tu-tupeeter-tu, ter-tu-wée”. Also has a bulbul-like melodious but repetitious chattering, “chiquea chiquea chiquea”. Main call a rising fluty whistle, “hoooo-reee”, ending much higher-pitched; at beginning and end of day a babble resembling sound of small bells.

**Habitat.** Undisturbed wet luxuriant montane evergreen forest, especially near streams, at 900–1800 m; 1500–1800 m on Mt Namuli; 1450 m to at least 1720 m in Udzungwa Mts, where it keeps to areas with scattered tall herbs and also places with open forest floor surrounded by dense patches of shrubs, herbs and *Cyperus*.

**Food and Feeding.** Invertebrates; stomach contents revealed insects. Terrestrial; forages invariably on ground. Tosses leaves in search of items. Rather territorial; keeps to an area even when subject to human disturbance (camping), but will leave if disturbance too heavy.

**Breeding.** Juv in Nov (E Usambara Mts) and breeding-condition bird in Nov, adult with brood patch in early Aug and another with brood patch in late Mar (Udzungwa Mts) in Tanzania; breeding-condition bird and one in apparent post-breeding moult in Nov–Dec in Mozambique. No other information.

#### **Movements.** Resident.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Tanzania–Malawi Mountains EBA. Rare to locally fairly common. Global population estimated at 10,000–20,000 individuals, within total geographical range of 6100 km<sup>2</sup>. Nominative race, although originally considered rare, is at least patchily numerous, with at least 2.5 birds/ha in one area, and likely total population in the low thousands; forest habitat in its altitudinal range, however, under increasing pressure from encroaching human population. Race *amani* is relatively rare, with population estimated at between a few hundred and a few thousand individuals (depending on degree to which it is restricted to Amani region); clearance of forest understorey for cardamom plantations in E Usambaras has created extensive areas uninhabitable by this species. Udzungwa race *sanjei* uncommon in Mwanihana Forest, but fairly common in S part of Udzungwa National Park, where 31 pairs/km<sup>2</sup>, and rather uncommon in remote wet luxuriant forest in the Ndundulu Range.

**Bibliography.** Benson & Irwin (1975), Beresford *et al.* (2005), Collier & Stuart (1985), Dinesen, Leimberg, Raboin & Fieldso (2001), Dinesen, Leimberg, Nylen & Jansen (1993), Fieldso (1999), Jensen & Bogger-Jensen (1997),



differs significantly in size, colour of underparts and extent of male's black upper breast; the two species approach each other geographically to within 100–150 km. Monotypic.

**Distribution.** Western Cape and SW Eastern Cape, in S South Africa.



**Descriptive notes.** 23–25 cm; 54–60 g. Striking ground-dwelling passerine, streaked grey and black above, with chestnut rump and underparts, black throat with white moustache, long and rounded white-tipped black tail. Male has crown, hindneck, upper ear-coverts, mantle, scapulars and back silvery grey with dense black streaks, rump rich chestnut, tail glossy black with increasingly broad white tips on outer feathers; upperwing-coverts black with white tips, flight-feathers black, outer primaries and inner secondaries tipped white, white patch at base of primaries; vague supercilium silvery grey, lores, cheek, lower ear-coverts, lower neck side and chin to upper breast black, submoustachial to upper breast side white, mid-breast to belly rich chestnut, vent and thighs blackish with buffy-grey tinge; iris orange-red; bill and legs black. Female is similar to male, but olive-brown replaces silvery grey above, rump and belly paler red, wings brownish-black, sides of face and neck buff-mottled grey-brown, submoustachial, chin and throat buff with dark grey-brown mottling. Juvenile resembles a weakly marked female. **Voice.** Song an often long series of penetrating piping notes, “psu-wee-psu-wee-psu-wee” and “sip-sip-psu, sip-sip-psu”, or more varied “peeup tri-tri-tri chi-treeecrip...”. Confrontations between territorial groups involve short piercing whistles. Monosyllabic contact and alarm calls; parent-offspring contact call a soft “cheee cheee chee-chee-chee-chee”.

**Habitat.** Rocky fynbos, from mountains down to sea-level, but particularly in windswept, high-rainfall areas on upper mountain slopes and ridges.

**Food and Feeding.** Invertebrates, occasionally small lizards and amphibians. Prey brought to nests at one site include caterpillars (30%), beetles (Coleoptera; 27%) and annelid worms, flies (Diptera), Hymenoptera, Orthoptera, spiders (Araneae) and scorpions (Scorpiones), less often geckos (Gekkonidae) and amphibians (*Brevicaps*). Forages on ground, probing with bill in sand around base of rocks and bushes, scuttling between patches of cover. Generally in pairs or family groups.

**Breeding.** Jul–Jan, mainly Sept–Oct. Breeds as monogamous pair in permanent all-year territory of 4–11 ha. Co-operative, with helpers. Nest, built by both sexes in 3–7 days, then lined added for 5–10 days before egg-laying; an untidy bowl of grass, twigs, rushes, lichen and moss, lined with fine grass, rootlets, hairy *Protea* seeds and mammal fur, placed on ground at base of rock or clump of vegetation, entrance oriented to protect against wind. Clutch 2 eggs, white, sometimes with reddish speckling; replacement clutches laid if first lost; rarely three attempts in season; incubation by both sexes (once by two females), period 19–21 days; nestling period 18–21 days (mean 19.5 days); young escape on foot but cannot fly for 5 days, with longer flights from day 10, fed by both parents and by any helpers present generally for 4–5 days but up to 30 days after fledging; of five ringed nestlings, three still on natal territories in following breeding season. Of 60 eggs (30 nests) at one site, 39 hatched, producing 24 young; losses due mainly to predation.

**Movements.** Resident; possibly some altitudinal movements.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Cape Fynbos EBA. Locally common. Potential threats include spread of exotic vegetation.

**Bibliography.** Beresford *et al.* (2005), Ericson & Johansson (2003), Ericson *et al.* (2003), Fry *et al.* (2000), Harrison *et al.* (1997), Hockley *et al.* (2005), Holmes *et al.* (2002), Macleod (1966), Martin (1964), du Plessis *et al.* (1995), Stattersfield *et al.* (1998), Winterbottom (1973).

## 308. Drakensberg Rockjumper

### *Chaetops aurantius*

**French:** Chétopse doré **Spanish:** Saltarrocas del Drakensberg  
**German:** Orangebrust-Felsenspringer  
**Other common names:** Buff/Orange-breasted Rockjumper

**Taxonomy.** *Chaetops aurantius* E. L. Layard, 1867, near Graaff-Reinet, west Eastern Cape, South Africa.

Affinities uncertain. Recent biomolecular evidence suggests that this genus, rather than being included in present family, is more closely related to the picathartes (Picathartidae), but sufficiently distinct in structure, behaviour and breeding biology to merit placement in its own separate family, Chaetopidae. Further research needed. Commonly treated as conspecific with *C. frenatus*, but differs significantly in size, colour of underparts and extent of male's black upper breast; the two species approach each other geographically to within 100–150 km. Birds in Lesotho reportedly paler below than those in rest of range, but no subspecies described. Monotypic.

**Distribution.** Lesotho highlands and adjacent South Africa in montane Free State, KwaZulu-Natal and Eastern Cape.



**Descriptive notes.** 21–22 cm; 48–53 g. Striking ground-dwelling passerine with long and rounded white-tipped black tail, similar to *C. frenatus*. Male has crown and upper face to upper back blackish with dense but narrow grey-brown streaks, lower back and rump chestnut, tail glossy black with increasingly broad white tips on outer feathers; primary coverts black, tipped white (forming patch on folded wing), flight-feathers brownish-black, white patch at base of primaries (visible in flight); narrow supercilium and broad submoustachial band white, upper ear-coverts rather plain grey, lores, cheek, lower ear-coverts, throat and upper breast black,

lower breast and belly sandy orange, colour most intense across breast; iris orange-red; bill and legs black. Differs from *C. frenatus* mainly in being smaller and smaller-billed, with underparts (but not rump) sandy orange (instead of chestnut), black of throat ending higher on upper breast, white supercilium more obvious, upper ear-coverts rather plain (not heavily streaked). Female is similar to male but usually paler above, throat mottled buffy white. Juvenile is like female but browner, less streaked

above, with bill paler. **Voice.** Song consists of series of various strident piping calls, notably a loud staccato “pree-pree-pree”, loud repeated “teep-teep-téep” and “pee-téé-teep”, sometimes in combination, very similar in tone and type to that of *C. frenatus* but distinct in structure; song often given simultaneously by group-members, and tail often fanned and depressed during singing. Male with nestlings gave repeated sharp piercing “pee” on descending scale, and harsh “churrrr”.

**Habitat.** Steep-sloping alpine and subalpine grasslands with rocky outcrops, scree, rocky gulleys and passes, but disappearing where extensive scrub cover and flat ground appear; mainly above 2250 m, but at 2000 m in KwaZulu-Natal and 1800 m in Eastern Cape.

**Food and Feeding.** Invertebrates, including caterpillars and moths (Lepidoptera) and grasshoppers (Orthoptera); nestlings fed mainly with caterpillars, but at one nest only grasshoppers. Forages on ground, pecking and scratching at earth, and bounding from rock to rock without flying. Usually in pairs or in family parties up to twelve individuals, but often dispersed widely when feeding.

**Breeding.** Jul–Apr, mainly Oct–Nov. Breeds as monogamous pair, in territory. Co-operative, with helpers. Nest, built by both sexes, a bulky, untidy deep cup, made mainly of grass with some twigs, lined with fine grass and rootlets, sometimes also mammal fur, typically just above ground under overhanging rock or shrub or in grass clump, especially wiregrass (*Merxmüllera*). Clutch 2–3 eggs, white, sometimes with black speckling; incubation by both sexes. No other information.

**Movements.** Resident or altitudinal migrant. Although reportedly resident in Lesotho, even above 3000 m, recorded also as making regular winter movements from 2500 m down to 2000 m along Lesotho–South Africa escarpment.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Lesotho Highlands EBA. Locally common; global population estimated at 100,000–500,000 individuals. Population in Lesotho estimated at 10,000–100,000 individuals, with density of 4 birds/km<sup>2</sup> in summer, 1.6/km<sup>2</sup> in winter; in summer, near Katse (Lesotho), average 1 pair or group/30 ha. Present in mid-winter in Mountain Zebra National Park, in Eastern Cape (South Africa).

**Bibliography.** Barnes (1969), Beresford *et al.* (2005), Bonde (1993), Brown & Barnes (1984), Ericson & Johansson (2003), Fry *et al.* (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockley *et al.* (2005), du Plessis (1990), Stattersfield *et al.* (1998), Tait (1948), Winterbottom (1973).

## Genus MYSTACORNIS Sharpe, 1870

### 309. Madagascar Groundhunter

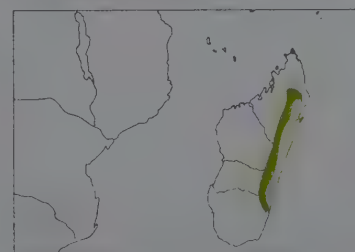
#### *Mystacornis crossleyi*

**French:** Mystacorne de Crossley **German:** Crossleytimalie **Spanish:** Tordina Malgache  
**Other common names:** Crossley's Babbler

**Taxonomy.** *Bernieria Crossleyi* A. Grandidier, 1870, Lake Alaotra, Madagascar.

Affinities uncertain. Appearance unlike that of a “true” babbler; has sometimes been placed tentatively in family Vangidae; further study required. Monotypic.

**Distribution.** E Madagascar.



**Descriptive notes.** 15–16 cm; 21–28.5 g. Small babbler-like passerine, olive-brown above and greyish below, with proportionately very long, narrow, slightly hook-tipped bill. Male has crown blackish-olive, with bluish-grey tinge laterally and on nape (all-over bluish-grey sheen in some lights); upperparts olive-brown, upperwing brown with paler olive-brown wing flash, tail rufescent brown; lores to above eye black, top and bottom of eyering white, upper ear-coverts glossy blackish-blue, lower ear-coverts black, submoustachial line under eye and ear-coverts to neck side white; chin and malar area to upper breast blackish-grey, shading

grey on breast, greyish-white belly and vent, dull ochreous-olive flanks and lateral undertail-coverts; iris dark brown to chestnut; bill black, lower mandible bluish or pale grey with black tip; legs pink. Female is like male, but crown as upperparts, tail less rufescent, lores, supercilium and upper ear-coverts mid-grey, chin and submoustachial area to mid-belly white, slight grey wash on breast. Juvenile is like female, but head chestnut, eyestripe black, neck chestnut, upperparts rufous, throat and underparts light chestnut, white centre of breast and belly. **Voice.** Song consists of three parts, a short, high-pitched, swelling “wee wee” (audible at close range), followed by prolonged, plaintive, resonant, sweet, melancholy, high-pitched whistle “tweeeeee” or “tsuuiooeeee”, and finally a harsh “tsishrrr”. Also has series of single-note whistles, “tooe tooe tooe”, sometimes given in rising series. Calls include very high “peeceer” and loud chacking in alarm.

**Habitat.** Primary broadleaf evergreen forest, also logged-over guava (*Psidium cattleianum*) forest, from sea-level to 1800 m.

**Food and Feeding.** Stomachs of three individuals contained spiders (of family Salticidae), cockroaches (Blattodea), earwigs (Dermaptera), bugs (Hemiptera, including homopterans), grasshoppers (Orthoptera) and ants (Formicidae). Found singly or in pairs. Walks or runs along ground, rarely flies; bobs head backwards and forwards when walking. Forages in open undergrowth and understorey of forest, among leaf-litter; also on or next to fallen trunks and rotten trees, probing mosses and epiphytes with bill.

**Breeding.** Aug–Nov. Nest, built by male, at least, a shallow cup or platform of largish twigs, sometimes fine black rootlets, lined with root-like material, or neatly woven grass and fern leaves, placed up to 1.5 m above ground in small tree, sessile pandan, or base of crown of tree-fern or on horizontal vines. Clutch 2–3 eggs, white, mottled with chestnut; incubation by both sexes. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Fairly common to common throughout habitat, but patchily distributed; rarer in SE and at lower elevations. Present and fairly common in reserves at Périnet-Analamazaotra, Marojejy, Mantadia, Ranomafana and Andohahelo (parcel 1). **Bibliography.** Benson *et al.* (1977), Dee (1986), Goodman *et al.* (1997), Hartlaub (1877), Irwin (1983), Langrand (1990), Milne-Edwards & Grandidier (1881), Milon *et al.* (1973), Morris & Hawkins (1998), Rand (1936a), Safford & Duckworth (1990).

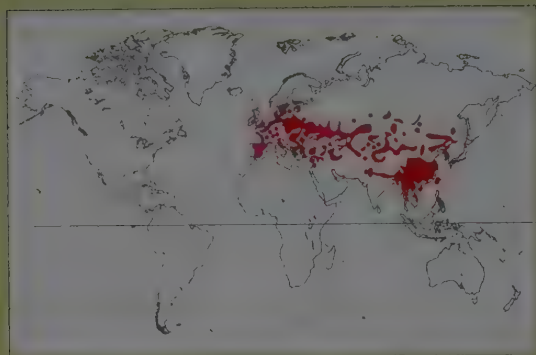


## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family PARADOXORNITHIDAE (PARROTBILLS)



- Small passerines with strong arched bill, strong tit-like legs and feet, and longish tail; plumage mostly brown, grey and rufous in various combinations, often some black markings.
- 9.5-28.5 cm.



- Palearctic and Oriental Regions.
- Bamboo, grass, scrub and broadleaf evergreen forest, in lowlands and mountains.
- 3 genera, 21 species, 62 taxa.
- 3 species threatened; none extinct since 1600.

## Systematics

Apart from one or two of the 21 species, the parrotbills represent a relatively little-known group of Old World passerines. Their centre of distribution lies in central Sichuan, in China, where twelve species are found. From here, the ranges of the various forms radiate as far westwards as the Western Palearctic and Central Asia, where the widespread Bearded Parrotbill (*Panurus biarmicus*) occurs, and north to Mongolia, east to the south-east Russian region of Ussuriland, the Korean peninsula and Taiwan, and south to south-central Vietnam and east Cambodia, where the Black-crowned Parrotbill (*Paradoxornis margaritae*) has its very restricted range.

Historically, the parrotbills have been treated in various ways by systematists and taxonomists. E. W. Oates and W. T. Blanford, writing at the end of the nineteenth century, treated them as a subfamily of the crows (Corvidae). Later, in 1914, H. H. Harington included them in the babblers (Timaliidae). In 1922, E. C. Stuart Baker separated them as a distinct family, placing them between the tits (Paridae) and the nuthatches (Sittidae), the latter preceding Timaliidae in the sequence.

Recent research suggests that the parrotbills may not merit separation at the family level. Analyses of mitochondrial DNA by A. Cibois, with results published in 2003, indicate that, contrary to the 1990 classification by C. G. Sibley and B. L. Monroe, the babblers do indeed form a distinct family, and that the parrotbills belong therein. Nevertheless, for the present work their status as a separate family, Paradoxornithidae, is maintained.

As constituted herein, the family contains the three genera *Panurus*, *Conostoma* and *Paradoxornis*, the first two of which are monotypic. The third genus, *Paradoxornis*, has in the past sometimes been subdivided into several further genera. In this latter arrangement, the Black-breasted (*Paradoxornis flavirostris*), Spot-breasted (*Paradoxornis guttaticollis*) and Reed Parrotbills (*Paradoxornis heudei*) are retained in *Paradoxornis*, with the Three-toed (*Paradoxornis paradoxus*) and Brown Parrotbills (*Paradoxornis unicolor*) separated in the genus *Heteromorpha*, the Short-tailed Parrotbill (*Paradoxornis davidianus*) isolated in *Neosuthora*, the Grey-headed (*Paradoxornis gularis*), Black-crowned and Greater Rufous-headed Parrotbills (*Paradoxornis ruficeps*) combined in the genus *Psittiparus*, and ten of the remaining eleven *Paradoxornis* species placed in the genus *Suthora*.

In the light of the above, it is of additional interest that provisional DNA analysis suggests that the genus *Paradoxornis*, as

currently constituted, may not be monophyletic. One initial analysis-tree even indicates that certain "Suthora-type" parrotbills, namely the Short-tailed and Black-throated Parrotbills (*Paradoxornis nipalensis*), are more closely related to the timaliid Grey-headed (*Fulvetta cinereiceps*) and Golden-breasted Fulvettas (*Lioparus chrysotis*) than they are to the Grey-headed and Spot-breasted Parrotbills.

Some initial findings of more detailed ongoing genetic research specifically on parrotbills, being undertaken by C. Yeung and colleagues, suggest only a distant relationship between the Bearded Parrotbill and the other members of the family. Furthermore, it appears that the creation of at least two (possibly more) new genera of parrotbills may need to be considered, one for the Reed Parrotbill and the other for the Spectacled (*Paradoxornis*



The parrotbills are strictly Asiatic in distribution. The **Great Parrotbill**, the largest member of the family, is generally placed in the monotypic genus *Conostoma*. Its pale orange bill is longer than it is high, and proportionately much longer than the bills of most other parrotbills. Both sexes are grey-brown, with a flash of rufous on the inner wing and a whitish forehead. This species occurs in mountainous regions from north India to central China and Myanmar in open broadleaf forest, bamboo, and scrub, including rhododendron (*Rhododendron*).

[*Conostoma aemodum*, Wawushan, Sichuan, China.  
Photo: John & Jemi Holmes]

The genus *Paradoxornis* currently spans all but two members of the family, as well as a great deal of phenotypic variation. It can be divided into up to five subgenera, most of which may require separation at the genus level once well-sampled genetic analyses have been completed. One of these groupings is *Heteromorpha*, containing the **Three-toed Parrotbill** (*Paradoxornis paradoxus*) and the **Brown Parrotbill**. These species are large and drab, with subtle facial patterning and very stubby bills, greater in depth than they are in length. Like many parrotbills they are associated with bamboo at high elevations.

[*Paradoxornis unicolor*,  
Erlangshan,  
Sichuan, China.  
Photo: John & Jemi  
Holmes]



*conspicillatus*) and Vinous-throated Parrotbills (*Paradoxornis webbianus*).

At the species level, a number of modifications to the generally accepted taxonomy have been made since the mid-1990s. The recent separation of the Black-crowned Parrotbill from the Grey-headed Parrotbill has already been mentioned; this split was considered justified on the grounds of morphological and plumage differences, as well as vocal ones. Although T. Inskipp and colleagues in their 1996 *Annotated Checklist of the Birds of the Oriental Region* preferred to "lump" the Golden Parrotbill (*Paradoxornis verreauxi*) with the Black-throated Parrotbill, the two are very distinct morphologically from each other, and again treatment as two separate species does seem warranted.

Over the years, the dozen or so taxa making up the "the Vinous-throated Parrotbill complex" have been divided variously between two or more species. It now seems that three polytypic species, the Vinous-throated, Brown-winged (*Paradoxornis brunneus*) and Ashy-throated Parrotbills (*Paradoxornis alphonisianus*), are involved. All three have sometimes been regarded as conspecific. In 1991, following a detailed taxonomic study, Han Lianxian reported constant skeletal differences "in the shape of the lachrymal and orbital process of quadrates" between the Brown-winged and Vinous-throated Parrotbills, supporting the already widely accepted status of the two as separate species. The Brown-winged Parrotbill apparently has long, pointed lachrymals, which are roughly V-shaped, and the pointed socket of the inside of the quadrate is turned downwards. The Vinous-throated Parrotbill, on the other hand, has the lachrymal shorter and blunt, and U-shaped, and the sharp socket of the quadrate is not curved.

Where the range of the Ashy-throated Parrotbill meets that of the Vinous-throated Parrotbill, the two species can sometimes be found in mixed flocks, and hybrids between them have been recorded in these flocks, as, for example, near Sa Pa, in northernmost Vietnam. Apparent hybrids have been reported also in north-west Italy, where individuals of both species, released locally from captivity, have formed free-living populations in several areas (see Relationship with Man). Considering the level of association between the two, however, hard evidence of interbreeding is surprisingly scarce. From central China, there are several specimens considered to exhibit a range of intermediate features, and a separate report of interbreeding, both from central Sichuan and both in the first half of the twentieth century. It has been suggested that the race *ganluoensis* of the Ashy-throated Parrotbill is an intermediate form between this species and the Vinous-throated

Parrotbill, but this seems highly unlikely, as its range lies not within the overlap zone but, instead, to the west of that of the nominate race of the Ashy-throated; *ganluoensis* is thus closer geographically to the Brown-winged Parrotbill.

The Black-throated Parrotbill currently comprises a grouping of ten highly distinctive subspecies. Modern taxonomists would argue that these represent more than one species, and a simple division according to basic plumage differences would support the following five sibling species: the "Grey-capped Parrotbill", consisting of the nominate race and subspecies *garhwalensis*; the "Orange-eared Parrotbill", currently race *humii*; the "Grey-breasted Parrotbill", made up from races *poliotis* and *feae*; the "Buff-breasted Parrotbill", containing the taxa *ripponi* and *patriciae*; and the "Black-eared Parrotbill", represented by the current races *beaulieu* and *kamoli*. Examination of speci-

A group of ten species are sometimes separated in the genus *Suthora*. One of these, the **Black-throated Parrotbill**, is an exquisite little bird of montane forests. It forages in small energetic groups, like tits (*Paridae*), even hanging upside-down in a tit-like fashion. It has a highly fragmented population in Asian mountain ranges, providing a good example of the challenge and flux evident in avian systematics: regional forms are distinctive, and deeper analyses of molecular, morphological and vocal data will probably reveal that at least five species are involved.

[*Paradoxornis nipalensis*  
*poliotis*,  
Gaoligongshan,  
Yunnan, China.  
Photo: Christian Artuso]







mens in the Natural History Museum at Tring, in England, suggests that the tenth subspecies, *crocotius*, may be better regarded as representing a semi-stable hybrid population between *humii* and *poliotis*. "Typical" *crocotius* specimens are from Yonpu La, in east Bhutan, and Shakti, in extreme west Arunachal Pradesh; one from Yonpu La, however, shows a slightly closer resemblance to *humii* than do the others, and specimens from Deothang, to the south of Yonpu La, have more grey on the ear-coverts, suggestive of *poliotis*. Further, Black-throated Parrotbills from the Dafla Hills, several hundred kilometres east of Shakti and extending southwards into Assam, have been described as an additional subspecies, *daflaensis*, but this is currently treated as a synonym of *poliotis*; nevertheless, they appear to exhibit signs of intergradation with *poliotis*, rather than being identical with it, and are possibly better treated along with *crocotius* as a semi-stable hybrid population.

Finally, it is worth mentioning the taxonomy of the Reed Parrotbill, two subspecies of which are currently recognized. In 1979, L. S. Stepanyan proposed that the east Mongolian population represented a third form, which he named as *mongolicus*. This was said to differ from the subspecies *polivanovi*, which occurs in north-east China and Ussuriland, in adjacent south-east Russia, in having a slightly purer grey mantle lacking dark streaks, and a slightly darker back, rump and breast side. All of these characters, however, could be due to minor clinal variation. It was also suggested that *mongolicus* was slightly smaller. Almost 20 years later, in 1998, Stepanyan concluded that *polivanovi* was worthy of full species status, with *mongolicus* incorporated as a race of it, and that "*P. polivanovi*" formed a superspecies with a now restricted *P. heudei*; in this arrangement, the latter's range was that of the current nominate race, extending from south-east Shandong south in east China to north Zhejiang and along the lower Yangtze River.

Stepanyan's entire theory was based on a presumed "huge" gap between the northern and southern taxa. Since then, however, a number of Reed Parrotbill populations have been found in the intervening areas, and it is very likely that, in time, this species will prove to have a fully "joined-up" range. In addition, the possibility remains that the differences currently considered to characterize the subspecies *polivanovi* may represent no more than one end of a cline of geographical variation.

From the foregoing brief discussion, it is clear that the taxonomy of the parrotbills, at present treated as 21 species within a single family, the Paradoxornithidae, will almost certainly undergo radical modification in the not too distant future. In the meantime, however, it is probably more helpful to maintain the existing arrangement while field and laboratory research continues.

## Morphological Aspects

More than 80 years ago, Stuart Baker stated that the parrotbills differ from the babblers simply in having the nostrils completely covered by bristles. The bill is very deep, being greater in depth than in length, except in the case of the two monotypic genera *Panurus* and *Conostoma*. The culmen is strongly downcurved, and the mandibles of most species have the edges at least wavy in shape or even S-curved. The bill bears a resemblance to those of parrots (Psittacidae), hence the English name of "parrotbill". The nostrils are circular, and are shielded by plumules or, in the case of *Panurus*, by a coriaceous membrane. All parrotbills have typically short and rounded wings, and the flight is rather weak and direct.

Parrotbill plumages are mostly brown, grey and rufous in various combinations, often with some black markings. With a single exception, the sexes of parrotbills are alike. Indeed, they are very difficult to tell apart, even in captivity, except perhaps by their behaviour during the breeding season.

The only sexually dimorphic member of the family, the Bearded Parrotbill, has a bill that is not parrot-like but is relatively long and pointed. The culmen and the cutting edges are gradually decurved towards the sharp tip. The nostrils are small, narrow, and partly covered by a membrane above; they are partially hidden under hair-like bristles projecting from the bill base. The tail is long and graduated. The male is rather attractive, having a grey head with a characteristic broad, long black "moustache"; it is otherwise essentially light rufous-chestnut above and white to creamy below, becoming pale vinous-pink on the belly sides, with darker flanks and vent and black undertail-coverts. The female, in contrast, is drab brown from the forehead to the nape, with pale grey confined to the rear side of head, and without the distinctive moustache of the male; she is also somewhat duller above and duller and paler below. Both sexes have dark brownish-grey to greyish-black wings, with a distinct white panel formed by the outer fringes of the outer primaries and their coverts, bordered by a rufous panel created by the edges of the median and greater upperwing-coverts.

The other monotypic genus contains the Great Parrotbill (*Conostoma aemodium*). This is, as its name suggests, much larger than the other parrotbills, and it has a less graduated tail. The outermost pair of rectrices is about three-quarters of the total length of the tail. The bill is longer than it is high, and is proportionately much longer than that of other parrotbills, with the possible exception of the Bearded Parrotbill. Both males and females are grey-brown, with a whitish forehead.

*Paradoxornis* parrotbills, a total of 19 species in the current treatment, are probably best dealt with as five separate groups. The subdivisions of this genus, whether or not they are accorded taxonomic significance (see Systematics), do exhibit several features by which they may be recognized. Thus, the three "typical" *Paradoxornis* species, namely the Black-breasted, Spot-breasted and Reed Parrotbills, have a more graduated tail than that of the Great Parrotbill, with the outer feathers not more than two-thirds of the total tail length. In addition, the bill is much shorter and deeper; the cutting edge of the upper mandible has a deep S-shaped curve, and there is a corresponding curve in the lower mandible. The large and drab-coloured Three-toed and Brown Parrotbills are similar to the three aforementioned "typical" species, but with overall plumage resembling that of the Great Parrotbill. They are sometimes placed in a separate genus, *Heteromorpha*.

Members of the third group, the ten species which are sometimes united in the genus *Suthora*, have a tail that is long and graduated, the outer rectrices being about half the length of the central ones. The bill is short and thick, slightly longer than it is

Three species are sometimes separated in the genus *Psittiparus*. The **Greater Rufous-headed Parrotbill** is typical of this group in having the tail roughly equal in length to the wings and barely graduated, with the outermost feathers almost as long as the central ones. Its legs are exceptionally strong, an adaptation which allows it to forage acrobatically in patches of bamboo, a substrate it rarely abandons. Its global distribution extends from the Himalayas to the Annamite range of Laos and Vietnam.

[*Paradoxornis ruficeps*,  
Namdapha National Park,  
NE India.  
Photo: Ketil Knudsen]

The **Bearded Parrotbill**, a reedbed specialist, has a relatively long pointed bill, and a graduated tail. The male is rather beautiful, with soft plumage and a characteristic black "moustache" on a grey head. It is otherwise essentially rufous-chestnut above and creamy white below. The female, meanwhile, is mainly drab brown, lacking the male's distinctive moustache. Both sexes have dark wings, with a distinct white panel formed by the outer fringes of the outer primaries and their coverts, bordered by a rufous panel created by the edges of the median and greater upperwing-coverts. This species is an outlier in the family, and therefore always separated in the monospecific genus *Panurus*. Not only is it the only sexually dimorphic parrotbill but it is also the only one to have expanded its distribution westward to Europe. Furthermore, it is the only one with a bill that bears no resemblance to that of parrots. Its taxonomic relationships and evolutionary origins have puzzled ornithologists for over two centuries, resulting in considerable nomenclatural instability. The traditional name of "Bearded Tit" made way for "Bearded Reedling", which in turn has been replaced by Bearded Parrotbill. Indeed, this name is not assured any permanence either because, according to molecular evidence, even the link with parrotbills may be remote.

[*Panurus biarmicus*  
*biarmicus*,  
Espoo, Finland.

Photo: Markus Varesvuo]







deep, and with almost straight cutting edges. The nostrils are very small, circular, and completely concealed by plumules. These species have legs that are long in proportion to the body size, and they climb in a tit-like fashion, but also bounce between perches, and frequently hang upside-down. The ten species are the Spectacled, Vinous-throated, Brown-winged, Ashy-throated, Grey-hooded (*Paradoxornis zappeyi*), Rusty-throated (*Paradoxornis przewalskii*), Fulvous (*Paradoxornis fulvifrons*), Black-throated, Golden and Lesser Rufous-headed Parrotbills (*Paradoxornis atrosuperciliaris*).

One species, the Short-tailed Parrotbill, is the sole member of the "*Neosuthora* group". It has a tail that is less graduated and much shorter than that of other parrotbills, a bill that is proportionately larger and much deeper, and wings that are even more rounded. These characters, in combination, lend it an appearance

like that of a munia (*Lonchura*), a member of the family Estrildidae. This is the only parrotbill having the tail shorter than the wing.

The fifth block, the "*Psittiparus* group", contains the Grey-headed, Black-crowned and Greater Rufous-headed Parrotbills. These have the tail about equal in length to the wing, and hardly graduated, with the outermost feathers about five-sixths the length of the central ones. The legs are exceptionally strong.

Adult parrotbills undergo one complete annual moult, a post-breeding moult in the autumn. Juveniles typically moult into full adult plumage during the first autumn of their life.

### Habitat

In the minds of the majority of ornithologists, parrotbills are associated with bamboo, and, indeed, ten of the 21 species are primarily inhabitants of bamboo. Three species are associated with other types of grasses, including reeds. The remaining eight prefer secondary woody vegetation or open forest, but can occur in bamboo. The Vinous-throated Parrotbill and its close relatives occupy the widest range of habitats, having become adapted to occur in all kinds of marginal vegetation, such as secondary growth, scrub, hedges, bamboo groves, marshes, reedbeds, plantations, nurseries and the like. At the other end of the spectrum, the Grey-hooded Parrotbill is found only in bamboo and bushes in open mountain-top conifer forest and mixed fir (*Abies*) and rhododendron (*Rhododendron*) forest, the Bearded and Reed Parrotbills are very much restricted to reedbeds, and the Black-breasted Parrotbill is restricted to tall grassland.

Among the bamboo-loving species, the Three-toed, Fulvous, Short-tailed, Lesser Rufous-headed and Greater Rufous-headed Parrotbills, at least, rarely stray from this habitat. Of these five, the last two can often be found in consort with other bamboo-dependent species, such as the White-hooded (*Gampsorhynchus rufulus*) and Collared Babblers (*Gampsorhynchus torquatus*).

The altitudinal range occupied by the parrotbill family is a wide one, extending from sea-level up to an elevation of about 3660 m. The more lowland species are those associated with blocks of reeds and tall grassland, although the reedbed-dwelling species can sometimes be found at higher altitudes, as high as the limit of occurrence of suitable habitat within their ranges. The Bearded Parrotbill, for example, ascends to at least 3050 m. The species found within the broadest altitudinal zone is the Vinous-throated Parrotbill, which, in Taiwan, has evolved through limited competition to occupy areas from sea-level up to 3100 m. Indeed, it is thought probably to have the widest niche of any

The juvenile **Bearded Parrotbill** resembles the adult female, apart from several morphological peculiarities. It is more buff, and less chestnuttinged, and its lower mantle, back and outer rectrices are blacker. The immature male—pictured here—is duller overall than the adult male, lacking the vinous-pink tinge to the underparts, and having the black "moustache" restricted to the lores. The iris in juveniles is murkier than that of adults, becoming progressively lighter, and approaching light yellow to orange around the time of the juvenile moult.

[*Panurus biarmicus russicus*, Hungary.

Photo: Markus Varesvuo]



Signalling behaviour in parrotbills is poorly known. Given their group-living habits they must have developed subtle signals to mediate within-group and between-group conflicts, but virtually nothing has been written about their vocalizations and displays. This **Golden Parrotbill** is calling insistently while raising its spread tail, and fluttering its open wings. Whether the context and function of this behaviour is related to courtship or conflict is unknown. Parrotbill displays are probably babbler-like, and especially similar to group-living babblers.

[*Paradoxornis verreauxi*, Wawushan, Sichuan, China.

Photo: Nick Athanas]

Most parrotbills are distinctly gregarious. In the **Bearded Parrotbill** this is a seasonal feature, with breeding pairs and post-breeding families coalescing in the non-breeding season to form monospecific flocks. These gatherings vary in size and composition, containing up to 40–50 individuals, or even 200 at certain localities. These gatherings roam across major reedbeds during the winter months, before disbanding for the breeding season in February and March.

[*Panurus biarmicus russicus*,  
Kazakhstan.  
Photo: Gertrud & Helmut  
Denzau]



bird species in Taiwan. Those with the most restricted elevational ranges are, not surprisingly, all montane species. These are the Rusty-throated, Grey-hooded and Brown-winged Parrotbills, which live within altitudinal limits of, respectively, 2440–3050 m, 2350–3437 m and 1525–2800 m.

### General Habits

Several traits that are typical of timaliid babblers have been noted in the behaviour of the parrotbills, thereby reinforcing the view that the latter are, in fact, true babblers (see Systematics). These aspects of behaviour include the use of the feet during feeding, and the habits of allopreening, clumping in groups, and “in-out bathing”.

In general, parrotbills are very gregarious, and several species often associate with other relatively small passerines, including certain babblers, in mixed foraging flocks, commonly referred to as “bird waves”. Bearded Parrotbills occur in pairs and family parties, and after breeding form flocks of up to 40–50 or even, on occasion, 200 or so individuals. They remain in groups of varying size and composition during the winter months, before breaking up during February and March.

Social organization and flock dynamics of Vinous-throated Parrotbills have been studied in South Korea and Taiwan. In South Korean studies, it was confirmed that flock size changes seasonally. Flocks gradually increased in size from August onwards, with large parties of 100–140 individuals often observed during October–January. They were then noted as gradually decreasing in size from January onwards, with no large aggregations recorded after February. The flock size was characterized as small in April–July, medium-sized in August and September, large in October–January, and middle-sized again in February and March. Food quantity was the main factor governing the daily routine of flocks. During the non-breeding season, two kinds of flocks, termed “main flocks” and “peripheral flocks”, were noted in South Korea. Main flocks were considered to be larger and to have a defined home range, such as along a stretch of stream.

Members of winter flocks in Taiwan were classified in four categories: (1) core members, which never changed flocks; (2) regular members, which remained primarily in one flock, but visited or temporarily joined neighbouring flocks; (3) floaters, which moved among flocks, instead of having a long-term affiliation

with any specific one; and (4) peripheral members, which were seen in no more than two months in each year, these presumably being visitors from flocks outside the study area.

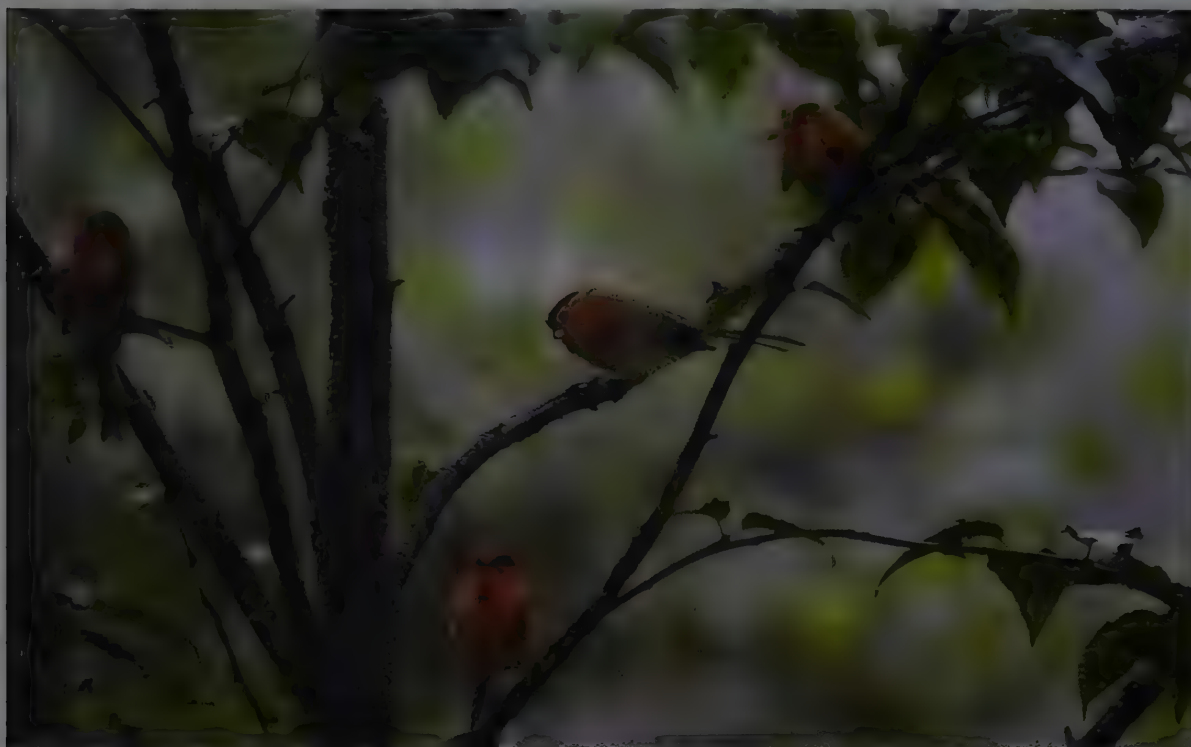
The ranges of different main flocks can overlap with one another, and two flocks have been observed to forage close together without merging. As they approached each other, it was noted that there was often great excitement and loud contact calling. Typically, when “main flocks” come close to each other or meet, they part quickly, without any transference of individuals, and without any signs of aggression or territorial behaviour. In Taiwan, when two flocks of Vinous-throated Parrotbills merged, a period of loud chorusing ensued, and the groups were seen to stay together for more than two hours, feeding and calling, before separating again.

Movement of an individual from one flock to another was noted in Taiwan as being of two types. The first involved temporary visits, and the second was a more permanent move lasting for more than two months. Temporary changes occurred when a parrotbill was accidentally left behind when a flock moved on, or when two flocks separated after having met. The individuals involved in these cases normally returned to their home flock shortly after the encounter. As many as 45–48% of individuals changed flocks during a three-year survey. The highest number of such changes made by an adult in one year was nine, and that of a juvenile was six. It has been suggested that inter-flock encounters and the switching of flock membership could be mechanisms that have evolved as a means of decreasing the likelihood of inbreeding. In South Korean studies, just a few individuals, having been initially identified as members of one flock, transferred to other flocks during October–January.

During a seven-year study in Taiwan, it was found that a Vinous-throated Parrotbill flock was composed primarily of the members of one or two extended families, spanning up to three generations, along with some individuals of unknown lineage. Furthermore, there was a remarkable similarity in the age composition of different flocks within a year, even though the age composition of the population as a whole differed from one year to another. Flock-leaders were not identified during Korean studies of Vinous-throated Parrotbills, nor was there any obvious evidence of aggressive behaviour between different pairs or individuals, or any social hierarchy.

Individual Vinous-throated Parrotbills that forage together during the day usually roost together, and neighbouring flocks





can also share the same roost. Most flocks of this species roost in specific areas at night, and flock-members separate into small clusters of individuals and spread out into suitable locations. Upon nearing the roost-site, they slow down, move to the lower vegetation level, and slowly hop towards the roost.

Bearded and Vinous-throated Parrotbills, two of the better-studied members of the family, are generally considered to be very weakly territorial. The main type of territorial behaviour appears to involve "supplanting", whereby an individual displaces an intruder of the same species by approaching it or sitting on a nearby perch. During the early part of the breeding season in South Korea, males were seen to drive away other parrotbills that were following them and their partner, and females were observed to supplant intruders. Fighting between pairs or individuals has not been observed in the wild. In captivity, breeding males of the Vinous-throated Parrotbill are considered to be bolder and more aggressive towards other species than are the females. Females are considered to be relatively constant in this respect throughout the year, usually watching or following the male. The minimal aggression that Vinous-throated Parrotbills exhibit is further evidence of their need for energy conservation (see Food and Feeding).

During studies of Vinous-throated Parrotbills, the birds were observed to be in pairs from March to August, corresponding with the breeding period, and pairs apparently form only after the break-up of winter flocks. During a two-year survey in South Korea, 78% of pairs consisted of individuals which were members of the same winter flock. During the early part of the breeding season, in March and April, some pairs were seen to feed away from their small flock during the daytime, returning to it before dark. Some pairs that had already built nests were still occasionally associating with the flock in April. Pairs typically breed within the home range of the particular flock to which they belong, but pairs consisting of individuals from two different flocks have also been recorded. Breeding-season studies in South Korea revealed that isolated single pairs were not unusual, but there were usually at least two or more pairs in close proximity (see Breeding).

Juvenile dispersal by the Vinous-throated Parrotbill has been studied. In South Korea, of 98 individuals of this species marked as nestlings, 16 were recaptured during July and August, but none in September, and it was considered that juveniles travelled far from breeding sites, and did not join the main non-breeding flocks

in the study area. On the contrary, many juveniles from nests outside the study area gradually joined flocks which also included birds that bred within their wintering ranges. In Taiwan, however, most juveniles, 66–96% in various studies, remained and bred in the parental flock, while the rest moved to neighbouring flocks, the discrepancy between the two regions perhaps reflecting differences in the study areas. The chances of breeding for a young bird seemed not to be influenced by whether or not it left its parental flock.

"High-flight" (see Movements) by Vinous-throated Parrotbills is apparently very rare and is thought probably to be a prelude to either eruptive behaviour or pair formation. Fledged young of the Bearded Parrotbill form pairs soon after independence, although it is not known whether these bonds are maintained up to the first breeding season, and they also congregate in flocks at this time. It



Many forest-based parrotbills live in permanent groups. The **Fulvous Parrotbill**, for example, travels in small parties all year round, although groups can swell to 30 individuals in the non-breeding season. These groups sometimes associate with foraging flocks containing other understorey bird species, especially babblers (Timaliidae). The factors underlying group composition in parrotbills are unknown, but flocks in at least one species contain the members of one or two extended families, spanning up to three generations, along with individuals of unknown lineage.

[*Paradoxornis fulvifrons* cyanophrys, Wawushan, Sichuan, China.

Photo: Christian Artuso]

Parrotbills frequently indulge in mutual preening, or allopreening. This is typically a form of mutual comfort behaviour undertaken by paired individuals, and is thought to enhance pair cohesion. The behaviour is perhaps even more regularly observed in group-living species, such as the **Spot-breasted Parrotbill**, but it is not known whether it is only undertaken by paired birds within the group. Allopreening, group-living, the use of feet during foraging, and "in-out bathing" are all forms of behaviour that link parrotbills to the timaliid babblers.

[*Paradoxornis guttaticollis*, Mt Victoria, Myanmar. Photo: Rob Hutchinson]

The **Bearded Parrotbill** switches seasonally from a vegetarian to a non-vegetarian diet, with interesting repercussions for foraging behaviour and digestive adaptations. In winter, it subsists on a diet of reed seeds, which it extracts by drawing parts of reed-heads through the bill while nibbling rapidly, as shown here. To digest these seeds the stomach develops hard plates and is filled with tiny stones. In spring these stones are excreted, and in summer the species captures adult and larval insects by snatching and flycatching at any height from the water's surface to the reed-heads. During this season the stomach is smaller and softer, with relatively few stones.

[*Panurus biarmicus biarmicus*,  
Espoo, Finland.

Photo: Markus Varesvuo]



has been suggested that the initial pair formation by juveniles might ensure that erupting groups, on arriving at their destination, contain an equal sex ratio. The flocks of juveniles are joined by adults once the latter have finished their breeding activities.

Parrotbills are seldom seen to fly for long distances. Even so, the Bearded Parrotbill, which has a rapid and direct flight style, can be seen to cover considerable distances over reedbeds. The flight of this species has been described as being rather mechanical, with whirring wingbeats, and often a strange "winding" movement of the tail, during which it is fanned and then suddenly twisted; the effect is that of level or slightly undulating but uneven flight progress.

Groups of Bearded Parrotbills roost in rows, each in physical contact with its neighbour, on reed stems. Mutual preening and head-scratching have been recorded for this species.

## Voice

The wide variation in morphology, biology and habitat requirements among the parrotbills is reflected also in their vocalizations.

The Bearded Parrotbill has a simple song of about three notes, as well as clear, loud ringing call notes. The Great, Three-toed and Brown Parrotbills, on the other hand, utter rather loud, clear and relatively well-phrased songs, consisting usually of up to four notes. The typical call notes of the first of these three species are wheezing, squealing, cackling and churring notes, whereas the Three-toed and Brown Parrotbills emit guttural calls, short shrill whining sounds and harsh crackling calls. The vocalizations of this trio are perhaps more like those of laughingthrushes (*Garrulax*) than those of other parrotbills.

Both Grey-headed and Greater Rufous-headed Parrotbills also have relatively well-structured songs, that of the latter species being particularly varied, jolly and emphasized. Both species give distinctive "jiow" and "jieu" call notes, those of the Greater Rufous-headed Parrotbill being somewhat louder and more clearly audible. In addition, the Grey-headed Parrotbill, when alarmed, utters harsh scolding rattles like those of a scimitar-babbler (*Pomatorhinus*), and the Greater Rufous-headed Parrotbill, in a similar context, emits a highly distinctive loud, metallic spluttering rattle resembling the sound made by a machine-gun.

Black-breasted, Spot-breasted and Reed Parrotbills have songs that are made up of variable series of clear, quite high stac-

cato notes. The songs of the two first-mentioned species are, unsurprisingly, very similar to one another, and both have a varied repertoire of songs of 3–7-notes and similar calls. The corresponding vocalizations of the Reed Parrotbill are equally varied, although often consisting of more notes. No obvious non-contact-type call notes have been recorded from Black-breasted and Spot-breasted Parrotbills, whereas the Reed Parrotbill may utter a subdued "jhew-jhew" or "jhjo-jho", reminiscent of certain calls of some other larger parrotbills.

In general, the *Suthora*-type parrotbills (see Systematics) utter short high-pitched songs, and have jumbled chattering flock-calls mixed with higher notes. The Lesser Rufous-headed Parrotbill has been recorded as giving varied series of rapidly repeated sharp chipping notes, but it is not clear at present whether this is the song. This species also emits subdued but rapid, jumbled, chattering call notes interspersed with harsher, more metallic notes. The songs of the Spectacled, Vinous-throated, Ashy-throated and Fulvous Parrotbills all consist of a series of 2–5 quickly delivered thin, high, often piercing notes, preceded, in the case of some species, by weak introductory notes. The songs of the Brown-winged and Rusty-throated Parrotbills are currently unrecorded, but they are likely to be very similar to those of the previous four species. The typical non-contact-type call notes of the Spectacled Parrotbill are slightly buzzy and mechanical-sounding, those of the Vinous-throated Parrotbill consist of subdued rapid chattering and chuntering mixed with thin, high piercing notes, and those of the Grey-hooded Parrotbill are harsh, abrupt, scolding, rather rasping sounds; the corresponding calls of the Rusty-throated Parrotbill are rather harsh, spluttering, rolling notes mixed with more tit-like calls, and those of the Fulvous Parrotbill are subdued and slightly spluttering.

Black-throated and Golden Parrotbills have strange, extended, high, wheezy, buzzy, nasal songs of 2–6 notes, but they also give extremely high, thin, steadily rising secondary-type songs of 2–4 notes which bear more resemblance to the songs of the other species in this *Suthora* grouping. These two species utter short rattles and quite harsh, low, slightly spluttering call notes, as well as scolding squeaky nasal call; some of the vocalizations of Golden Parrotbills, at least, are strongly reminiscent of certain ones uttered by the Golden-breasted Fulvetta, a typical timaliid babbler. Generally, the members of the *Suthora* group (see Systematics) give harsher more scolding call notes when agitated.





The **Ashy-throated Parrotbill** travels in parties of 10–40 individuals in the non-breeding season, foraging mainly on seeds and buds, although it may search for insects, if available. During the breeding season, the insect component increases, making up most of the food provisioned to nestlings. Insects are caught in a relatively sluggish manner by examining foliage and plucking off slow-moving forms such as larval lepidoptera or adult orthopterans. This species occurs in south China and north Vietnam, while a small population founded on escaped cagebirds is now established in Italy.

[*Paradoxornis alphonsianus*  
*alphonsianus*,  
 Bifengxia, Yaan,  
 Sichuan, China.  
 Photo: John & Jemi  
 Holmes]

The Short-tailed Parrotbill delivers a series of 6–9 very thin, high, rapid, ascending notes, and it also gives a more structured, three-stage secondary-type song. Jumbled twittering can often be heard from flocks of this species, which also emits harder, shrill, stressed series of short tit-like notes that probably function as alarm calls.

Finally, it may be mentioned that the vocalizations of the Bearded Parrotbill are, as one might expect, thought to be important for the cohesion of groups, especially during eruptive activity (see Movements). It is likely that the same applies to other species in this family.

## Food and Feeding

Parrotbills feed primarily on insects and spiders and on vegetable matter, especially seeds. Of particular interest is the Bearded Parrotbill, which adapts its diet according to the season. During the winter months, its stomach develops hard plates for digesting seeds and is filled with small stones, which are excreted in the spring. Fewer and larger stones are then ingested, and in the summer the stomach is smaller and softer, with few or no stones. Young Bearded Parrotbills, prior to fledging, are fed solely on a non-vegetarian diet.

This is a relatively agile species, hopping and jumping along reed stems, straddling more than one stem, and undertaking acrobatic movements while feeding on seeding reed-heads. It has been observed to draw parts of reed-heads through its bill while nibbling to extract seeds. It also hops, jumps and creeps over ground-level debris and mud. The Bearded Parrotbill is not capable of breaking open reed stems, but it pecks at the surface of these and at cracks in it, as well as at broken reed stems. It also scratches and probes the ground, digs holes in snow, turns over reed leaves, and makes short-range flycatching sorties from the tops of reeds.

It has been noted that, in captivity, Vinous-throated Parrotbills strip bamboo in search of grubs, and seldom attempt to catch flying insects, although they will take a moth (Lepidoptera) that has become trapped, and readily pick fruit flies (Drosophilidae) from flight wires, foliage and fruit-fly feeders. When eating large

grubs such as mealworms, in the form of larvae of the darkling beetle (*Tenebrio molitor*), and waxworms, the larvae of the greater wax moth (*Galleria mellonella*), they stand on the grub's tail and pull its head with the beak until the internal soft tissue is removed.

Wild-living Vinous-throated Parrotbills, in Taiwan, feed mainly on seeds, flowers, fruits and buds, insect food constituting only about 37% of the diet. They are primarily understorey-dwellers, but will visit the canopy of relatively small trees in search of certain flowers and seeds. During the period from December to March, lantana (*Lantana camara*) and the grass giant miscanthus (*Miscanthus floridulus*) were the most important species influencing habitat use by parrotbills in Taiwanese studies, although the importance of each of these varied from month to month. A plant species apparently became more popular when it was the most abundant food source in the habitat. It is thought that parrotbills keep fairly good track of the quality and quantity of plant foods in their habitat. Vinous-throated Parrotbills favoured an inter-branch distance on shrubs of 6–13 cm, and especially 6–7 cm. This is regarded as a relatively long distance, but one that can be covered in an easy hop, while shorter distance between branches may prove more difficult because of the typical gait of the bird. The parrotbills zigzag through their habitat, making detours to avoid crossing wide open spaces, and they often follow dense vegetation to a point where a narrower gap can be found before crossing from one patch of cover to another. Before crossing a gap of more than 5 m, the individuals at the front of a flock tend to call and to wait until those behind them catch up, and only then move across the opening.

Parrotbills evidently make decisions on habitat use which take into consideration the travelling "costs" within each habitat. Thus, the conservation of energy seems to be a primary concern for flocking parrotbills, and local vegetation structure or other habitat features can influence the amount of energy expended during foraging. Both the tracking of food abundance and the minimizing of travelling cost must have the effect of maximizing the energy return, and parrotbills concentrate on favoured areas having a high food supply, where the amount of energy that needs to be expended is not too great. Activity levels remain stable throughout the day, even during light to medium rainfall. Vinous-throated Parrotbills forage almost continuously during the day,

except for some short bouts of resting, bathing or preening. There are no clear early-morning and late-afternoon peaks in feeding activity. In Taiwan, this species, when awake, spent 85% of its time foraging or feeding.

Perhaps the most unusual observation of parrotbill feeding behaviour involved a Great Parrotbill in western China. Here, an individual of this species was seen to catch and carry off an adult Buff-barred Warbler (*Phylloscopus pulcher*), presumably to feed to its young.

### Breeding

Most of what is known about the breeding of this family relates to the two best-studied species, the Bearded and Vinous-throated Parrotbills.

Both of these species are monogamous, although bigyny has been reported for the Bearded Parrotbill. Little information is available on the courtship display and copulation behaviour. During the late winter, flights over reedbeds by male Bearded Parrotbills, as well as aggressive interactions between males and a reduced tolerance of females towards each other, are thought to relate to pair formation. During the winter and spring months, individual Vinous-throated Parrotbills in South Korea were occasionally seen to separate temporarily from their flock and fly up to the higher branches of a tree, while being pursued by one or more others of the species. Other courtship behaviour by this species involved short flights between perches, and a fluttering descent to the same or another perch. After these brief courtship pursuits, pairs would return to their flock. The courtship display of the male Bearded Parrotbill accompanies a three-note song; on the second note the bird stretches its head and neck slightly up, and on the third note it lowers its head, with the feathers ruffled, until its bill touches its breast.

Independent juvenile males of the Bearded Parrotbill, in aggressive confrontations with one another, ruffle up their back feathers, fan the tail and lower the head, and in this posture they run, with a stiff-legged gait, beside one another. Males occasionally display to females in a similar manner. Another display, by recently fledged juveniles, is thought to be related to early pair formation, and involves a male hopping beside a female while holding his tail fanned and twisted so that the undertail-coverts are exhibited to her.

Once Vinous-throated Parrotbills have formed pairs, the partners typically stay close together, except during the incubation period, and the male practises "mate-guarding", whereby he protects his mate from the attentions of other males simply by remaining close to her. During extensive work on Vinous-throated Parrotbills, only rarely has copulation been observed. This is thought to be due to the fact that, during the breeding season, pairs are rather secretive and spend their time in relatively dense vegetation, where they mate close to or on the ground. Copulation has been observed three times in South Korea, on each occasion lasting 2–5 seconds. On two of these occasions it took place on the ground, and in the third instance close to it. In one case it followed display, during which the male hopped next to the female, fanning and twisting his tail, and then flew jerkily for about 5 m. Females were noted as exhibiting evasive behaviour, and apparently did not allow copulation to take place without resistance.

Copulation by Bearded Parrotbills is apparently not preceded by a display, although the male hops towards the female while calling and raising his wings. During the initial stages the female behaves in an evasive manner, but later she is chased and then "raped". After the nests have been built, female Bearded Parrotbills permit copulation without resistance. The act of mating by this species also takes place on or near the ground, but it has been recorded as lasting for approximately 15 seconds. A

Several species of parrotbill, including the **Grey-headed Parrotbill**, are known to feed on very varied plant matter, including chestnuts, buds, seeds and fruit. A large item is removed and carried to a convenient twig, where it is held with the feet, in the manner of a tit (*Paridae*), and eaten piece by piece.

The Grey-headed Parrotbill is essentially a forest bird, and is much more arboreal than most of its relatives, although it sometimes drops to the ground to feed. It lives in small groups of 6–8 individuals, sometimes up to 30 or more, which often associate with babblers (*Timaliidae*) and other passerines in mixed flocks.

[*Paradoxornis gularis*.  
Photo: Cyril Laubscher]







The **Bearded Parrotbill** spends much of the time at the bases of reeds. It regularly drops to the ground, where it hops, jumps and creeps over debris and mud, pausing to scratch and probe the surface of the ground and to turn over reed leaves. It even digs holes in snow to get at the food items hidden beneath. With a dextrous grip of reeds, and manoeuvrable legs, it can easily cling low above water to take a drink, as demonstrated here.

[*Panurus biarmicus*  
*biarmicus*,  
Espoo, Finland.  
Photo: Markus Varesvuo]

In most parrotbill species, both sexes contribute to nest-building, incubation and chick rearing. Adult parrotbills eat a mainly vegetarian diet based around seeds and fruit, but young birds prior to fledging tend to be fed a non-vegetarian diet. Thus, this male **Bearded Parrotbill** is carrying a fresh load of insects back to its brood. Many granivorous or frugivorous bird species bolster the nestling diet with animal matter in this way, presumably because of the greater returns it offers in energy, protein and water content.

[*Panurus biarmicus*  
*biarmicus*,  
Netherlands.

Photo: Günter Ziesler]

recent study of sperm use by Bearded Parrotbills demonstrated that females copulated at a higher rate with their partner when other males were present, but that this did not translate into more sperm on eggs, possibly because insemination rates exceeded the female's sperm-storage capacity. It appears that this species copulates frequently because a single insemination is not enough to fertilize the entire clutch, and females have to continue to copulate during the egg-laying period in order to avoid the risk of their eggs being infertile.

Bearded and Vinous-throated Parrotbills tend to breed in concentrations of several pairs. Although isolated single pairs of the former are not rare, there are usually at least two pairs close together. In addition, there is a tendency for smaller breeding sites of this species to support higher densities. It appears that individual pairs of Vinous-throated Parrotbills can nest very close to one another, separated by no more than 3 m. No differences in breeding success were found, however, between solitary and loosely colonial nesting pairs of Vinous-throated Parrotbills during surveys in South Korea. In this species, the roles of the male and the female were found to be similar during the nest-building, incubation and nestling stages.

All parrotbills for which the relevant information is available construct deep cup-shaped nests, generally sited at relatively low levels. The material used in the construction consists of such items as dead reed blades and leaves of other marsh plants, grasses, strips of bamboo leaves, leaf skeletons, fine strips of bark, and in a few cases moss, and the structure is often reinforced with spider webs, which are plastered over the outside. The nest is generally lined with finer, softer material, typically fine grasses, fine roots, and shreds of dead leaves or bark, sometimes with hair and feathers added. Many parrotbill nests have a yellowish appearance overall, as a result of which they blend in extremely well with their surroundings and are often very difficult to locate.

The clutches of most parrotbills consist of two to four eggs, although the Ashy-throated Parrotbill normally lays three to five eggs, and occasionally six, and the Reed Parrotbill sometimes



lays five eggs. The exceptions to this general rule involve the two best-studied species. The Vinous-throated Parrotbill has a clutch size of three to seven eggs, five or six being the norm in South Korea and four or five in China and Taiwan. The most widespread member of the family, the Bearded Parrotbill, also lays the largest number of eggs. Its normal clutch is of 4–8 eggs, but up to eleven eggs have been recorded in a single nest.

Egg colour varies considerably among the species, and this further supports the subdivision of the family, in particular the

The **Reed Parrotbill** builds a beautiful cup-shaped nest supported in mid-air by three or more reed stems, a design similar to that of the Eurasian Reed-warbler (*Acrocephalus scirpaceus*).

The structure takes 6–7 days to construct from strips of dead reed sheaths, bound, rimmed and lined with filaments of dead reed stems, and wrapped with cobwebs for increased stability. The clutch, of 2–5 eggs, is incubated by both sexes for about 12 days. This species is the only member of the family with seasonal differences in plumage, the smart summer dress becoming generally duller in winter.

[*Paradoxornis heudei*  
*polivanovi*,  
Ussuriland, Russia.  
Photo: Yuri Shibnev]







The duties of nest-building, incubation of eggs and rearing of young are shared more or less equally by both sexes in the **Vinous-throated Parrotbill**. The nest itself is a shabby affair woven from coarse and fine grasses, leaves and fibres, and plastered with cobwebs. It is typically situated 40–90 cm above the ground among reeds, small bamboos, nettles (*Urtica*) or climbing plants, or in the fork of a bush; some have been found about 3 m up in small trees. In South Korean surveys, 141 nests were built in 28 different plant species, partly reflecting the broad overall habitat preferences. The species occurs in all kinds of marginal vegetation, such as secondary growth, plantations, scrub, hedges, bamboo groves, marshes and reedbeds.

[*Paradoxornis webbianus mantschuricus*, Ussuriland, Russia. Photo: Yuri Shibnev]

genus *Paradoxornis*, into several previously accepted genera (see Systematics). The eggs of *Panurus*, the Bearded Parrotbill, are creamy white, with fine dark brown markings. Those of *Conostoma*, the Great Parrotbill, have been described as dull white, sparsely blotched, streaked and smudged with pale yellowish-brown, and with pale inky-purple underspots and clouds; they have been said also to be white with sparse reddish speckles and/or blotches. The eggs of the Black-breasted, Spot-breasted and Reed Parrotbills, the "typical" *Paradoxornis* species (see Systematics), have a white or whitish ground colour with a tinge of green, brown or yellow, and with fairly varied brownish markings and paler brown to purplish undermarkings. No data are available for the Spectacled and Rusty-throated Parrotbills, but the remaining *Suthora*-type parrotbills lay plain bluish or white eggs. In contrast, the eggs of the *Psittiparus*-type species are more colourful: those of the Grey-headed Parrotbill have a whitish, greenish-white, grey, yellowish or reddish ground colour and those of the Greater Rufous-headed Parrotbill a whitish to dull cream-coloured or blue-grey ground, in both cases with complex buffish to brown or reddish markings and grey to purplish undermarkings. The Grey-headed Parrotbill's eggs are perhaps the most varied of those of any parrotbill. There is no information on the breeding of the third *Psittiparus*-type, the Black-crowned Parrotbill. Likewise, the eggs of the two *Heteromorpha* types, namely the Three-toed and Brown Parrotbills, and of *Neosuthora*, the Short-tailed Parrotbill, are currently undescribed.

Both Bearded and Vinous-throated Parrotbills often raise more than one brood in a year, and both have short nestling periods. Studies in South Korea revealed that some 23–27% of Vinous-throated Parrotbill pairs raise two broods during one season. A large proportion of pairs attempting a second brood were made up of the same two individuals as reared the first brood. In Taiwan, it was found that pair-members which succeeded in rearing more than 80% of the clutch to the fledging stage tended to remain together, and individuals which kept the same mate showed some signs of improved breeding success. Several double-brooded, monogamous bird species apparently exhibit high rates of mate-switching between nesting attempts within a single breeding season, but the rate of mate change among Vinous-throated Parrotbills is very low. It does, however, seem to be rare for a male to retain the same mate for more than one season. It was found that second nests were built close to the first nest if the latter had been successful, but far from it if it had failed, a strategy that is apparently employed as a means of reducing predation.

It is evidently common for single pairs of Bearded Parrotbills to begin laying in a new nest while still feeding a previous brood in a nest nearby. Under the correct circumstances, pairs can rear 10–20 young in a single season, one of the highest productivity rates of any European passerine. It has been postulated that early-reared young can themselves breed in August, after moulting. A captive juvenile in Europe apparently laid an egg on 21st July, after having completed an unusually early moult.



Of 33 nests of Bearded Parrotbills monitored during one study in Germany, 70% produced some fledged young, but only 51% of the total number of eggs laid produced fledglings. In another German study, it was found that 90% of 88 nests, and 63% of the eggs laid in 20 nests, produced fledged young. At 140 nests of Vinous-throated Parrotbills in Taiwan, the mean hatching success was 2.68 eggs per nest, corresponding to 64% of all eggs, and the mean fledging success was 1.9 young per nest, or 74% of hatchlings. In addition, pairs that laid larger clutches hatched significantly more eggs and fledged more young than did those laying smaller clutches. As one would expect, hatching and fledging success can vary significantly from one year to another. The proportion of Bearded Parrotbill eggs failing to hatch is also relatively high, with 11.4% recorded during one survey.

During the Taiwan studies, predation of Vinous-throated Parrotbill nests was found to be severe at both the egg stage and the nestling stage. Of 63 nests found before incubation had commenced, only 28, or 44.4%, survived to the hatching stage, and only 15 nests, just 23.8% of the total, produced any fledged young. On the other hand, nests that escaped predation had a high rate of hatching success, 87.8% of eggs laid, with an average of 3.9 eggs per nest.

Breeding success over two seasons of survey work in South Korea was about 43%. It has been found that clutches of six eggs have a higher hatching success rate than do those with four or five eggs. The Vinous-throated Parrotbill, which lays eggs of two different colour types, is a key host of the Common Cuckoo (*Cuculus canorus*) in South Korea. Results of studies there indicate that parrotbills laying white eggs, rather than blue ones, are favoured. It has been suggested that this egg-colour dimorphism evolved as a defence mechanism to combat perfect mimicry by parasites. It is thought that the egg mimicry on the part of the cuckoo has possibly evolved to match the most common egg colour type of hosts that exhibit egg-colour polymorphism. In South Korea, however, blue cuckoo eggs were found in both blue and white clutches of parrotbills, suggesting that the cuckoo did not discriminate between host egg colours when laying in nests of Vinous-throated Parrotbills. Egg colour is determined by the female parrotbill alone, and an individual will lay eggs of the same colour type throughout her life. Moreover, the egg colour type is apparently inherited by offspring.

Predation is the main cause of breeding failure of Vinous-throated Parrotbills, the primary natural culprits being the oriental tiger snake (*Rhabdophis tigrinus*) and the Eurasian Jay (*Garrulus glandarius*) in South Korea and snakes in Taiwan. In Taiwan, many nests were disturbed by humans, and some eggs and nestlings were taken. Other probable predators at the study site here included feral domestic cats (*Felis catus*), certain rodents (Rodentia), including the belly-banded squirrel (*Callosciurus erythraeus*), and an agamid lizard known as Swinhoe's japalura (*Japalura mitsukurii*). After heavy rain showers in Taiwan, adult parrotbills, with the plumage drenched, were seen to leave nests regardless of whether their mates had returned to replace them, and all of the instances of nest predation witnessed during studies occurred under such circumstances.

It appears that Vinous-throated Parrotbill parents encourage their offspring to leave the nest by calling to them, and that all the young leave more or less simultaneously. At two South Korean nests, it took 9–25 minutes for the six young to leave. Similarly, young Bearded Parrotbills are normally encouraged to leave the nest by their parents, which call and, as the chicks come out of the nest, hop away low down in the reeds, where they are followed by the youngsters. There have been reports that the male Vinous-throated Parrotbill, in captivity, often attacks and kills its offspring soon after the latter fledge. The extent to which such behaviour could be influenced by the unnatural circumstances of being held captive is not known.

Both sexes of the Vinous-throated Parrotbill become sexually mature after one year, and individuals of this species are known to have survived for at least seven years, although the maximum longevity is unknown. Pet stores report that this species dies more easily than do individuals of other wild-caught passerines. A ringed Golden Parrotbill lived for 11 years in the wild in Taiwan, and the longest-lived Bearded Parrotbill trapped to date was 6 years old.

During the seven-year study in Taiwan, the survival rate of Vinous-throated Parrotbills after their third year was found to be very low. Some did survive into their seventh year, but the majority died before reaching their fifth year. Juvenile survival to sexual maturity was high compared with mortality levels of older individuals. Predators on juvenile and adult Vinous-throated Parrotbills in Taiwan include the Brown Shrike (*Lanius cristatus*),

**The Bearded Parrotbill** is socially monogamous, although cases of bigamy have been reported. In typical pairs, both sexes build the nest, incubate the eggs, and feed the young. Clutches are highly variable in size from three to eleven eggs (usually 4–8). These are incubated for 10–14 days until they hatch, after which the nestlings are fed for 12–13 days, and sometimes up to 16 days.

This female is busy provisioning a brood of five very hungry chicks. They will leave the nest before they are able to fly, and will probably achieve full independence within two weeks of fledging. Each breeding season 2–4 broods are raised.

[*Panurus biarmicus*  
*biarmicus*,

north Kent, England.

Photo: Alan Barnes/NHPA]







The **Brown-winged Parrotbill** is a poorly known species from the mountains of Myanmar and south China, where it occurs in marginal habitats, including scrub, grass and thickets, as well as open forest and at forest edges. It is locally fairly common, and its favoured habitats are likely to be increasing in extent, rather than decreasing. It is therefore not considered to be threatened. Its global range is highly circumscribed, however, falling mainly within the Yunnan Mountains Endemic Bird Area, and it therefore qualifies as a restricted-range species.

[*Paradoxornis brunneus brunneus*, Tengchong, Yunnan, China. Photo: John & Jemi Holmes]

feral domestic cats, and even the golden web spider (*Nephila maculata*), the large webs of which are so strong that parrotbills are unable to break free from them.

## Movements

Parrotbills are largely sedentary. The only long-distance migrant in the group is the Bearded Parrotbill, which is well known for its periodic eruptive movements. These are thought to be an adaptation for relieving population pressure in breeding areas, and for colonizing new sites. Eruptions take place in the period September–November, after the breeding season has been completed, and involve mainly juveniles. Flocks rise steeply to 50–60 m or more, and small groups of individuals then break away and disperse out of sight. The direction taken by the parrotbills, which typically travel in pairs and groups, is dependent on the geographical occurrence of reedbeds. Some establish new colonies in the place where they spend the winter months, while others return to the site of origin in the following spring, in March–May. In Europe, a rapid increase in the breeding population of the Bearded Parrotbill in the Dutch polders during the 1950s and 1960s resulted in major eruptions during the 1960s and 1970s, scattering potential colony pioneers widely across north-western Europe. Of 7450 individuals ringed in Suffolk, in east England, during 1959–1973, a total of 53 was recovered in autumn and winter in Suffolk, whereas 113 were found in other English counties during those seasons.

It has been suggested that high-flying behaviour in winter and spring by Vinous-throated Parrotbills may similarly be linked with eruptive movements by pairs of this species. The young of this parrotbill undertake post-fledging dispersal soon after they become independent, at which time they leave the natal site with others of the species and move to the non-breeding range. Some cold-weather movements are recorded for Vinous-throated Parrotbills in north-east China and east Russia, between September and March/April, and there is also a record of a vagrant from the west coast of Japan.

Some parrotbill species make minor altitudinal movements, descending to lower, warmer, snow-free levels during hard weather. Even some of the small members of the family, however, are very hardy, and the extent of these winter movements has probably been exaggerated to some extent by certain authors.

## Relationship with Man

Parrotbills have no obvious relationship with human beings, apart from through the cagebird trade. Otherwise, the only interactions between parrotbills and man appear to be indirect ones, one such example being the adverse impact of human activities on parrotbill habitats (see Status and Conservation). Parrotbills do, however, hold a great appeal for birdwatchers, and many species are much sought-after subjects for observation.

Many species of parrotbill have been recorded as being kept in captivity, and there are regular shipments of wild-caught individuals from China to Europe and elsewhere. The most popular species appear to be the Vinous-throated and Grey-headed Parrotbills, reflecting their extensive Chinese ranges. Shipments of the former from the western extremities of its range have also included Ashy-throated Parrotbills, and these two species have recently established feral populations in Italy, originating from

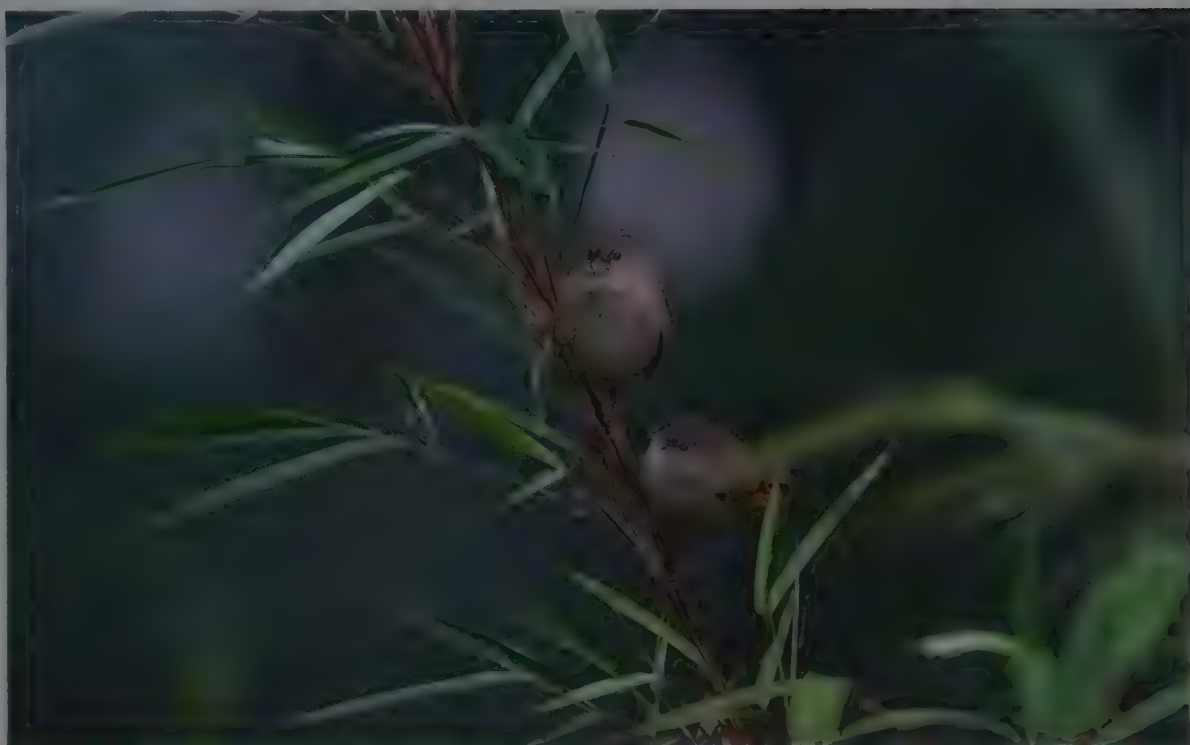


The **Black-breasted Parrotbill** occurred in the tall grasslands of north-east India and Bangladesh. It is now restricted to Assam, having disappeared elsewhere due to the destruction of grassland habitats by drainage and conversion. Remaining grassland fragments are heavily overgrazed, and intensively used by local people who harvest them up to three times a year for fodder and thatching. The species is classified as Vulnerable, and its survival depends on protected areas in India's Brahmaputra valley.

[*Paradoxornis flavirostris*, Dibru-Saikhowa National Park, Assam, India. Photo: Edward Vercruysee]

The **Grey-hooded Parrotbill** is a restricted-range species inhabiting open forest and scrub on exposed peaks and ridges in the Central Sichuan Mountains Endemic Bird Area. It is known from very few localities, and it may be under threat from habitat loss. However, it can survive at fairly high population density, and it is not clear whether its mountaintop environment is under much pressure. Moreover, its range is difficult to access and the species may be more widespread than current records suggest. It is thought to have a declining and severely fragmented population, and is classified as *Vulnerable*. Further surveys are necessary.

[*Paradoxornis zappeyi*  
zappeyi,  
Wawushan, Sichuan,  
China.  
Photo: Christian Artuso]



unwanted birds that were deliberately released into the wild. Fulvous Parrotbills are also kept in captivity, and they have been bred in the United Kingdom, at least.

In south-east China, seven members of this family were found in Liuhua market, in Guangzhou, during 2000–2003 alone. These are the Bearded, Great, Grey-headed, Spot-breasted, Vinous-throated, Golden and Short-tailed Parrotbills. Other species that have been kept in captivity include the Greater Rufous-headed and Reed Parrotbills, and it is likely that small numbers of the remaining species, too, have been held as captives.

Although there is no evidence that the illegal cagebird trade is having an impact on wild parrotbill populations, it is, in any case, a cruel and unnecessary business and one that should be more effectively prohibited.

### Status and Conservation

Globally, most parrotbill species are fairly common and widespread in relatively little-threatened habitats. Three species, however, are considered globally threatened. These are the Black-breasted, Grey-hooded and Rusty-throated Parrotbills, all of which are included in the conservation category of *Vulnerable*.

The Black-breasted Parrotbill is restricted to the Assam Plains Endemic Bird Area, in north-east India, and its current population size is unknown, but believed to be declining. It is already extinct in neighbouring Bangladesh. The primary threat to this species is the loss and degradation of its grassland habitat to agriculture and forestry plantations, dam and irrigation schemes, overgrazing by domestic livestock, and the intensive harvesting of the vegetation by local communities. This last activity is often associated with the use of burning.

Grey-hooded and Rusty-throated Parrotbills are primarily inhabitants of areas of bamboo in remote open forests of western China, and it is basically because of their small population sizes that they are considered to be *Vulnerable*. There is, however, no clear evidence that the population of either species has declined. The Grey-hooded Parrotbill has been recorded from only nine sites, and the Rusty-throated from four. Although status information is rather lacking, it seems that Grey-hooded Parrotbills can exist at fairly high densities in suitable habitat, but the small number of localities and the species' highly localized distribution suggest that it could have a small total popula-

tion. Virtually no information is available on the current population of the Rusty-throated Parrotbill, which is the least-known of all parrotbills. This species has been observed recently only at Jiuzhaigou Nature Reserve, in north Sichuan, and even there it has not been seen with any sort of regularity since a mass flowering and subsequent die-off of bamboo in the late 1980s. The main threat to these two species is likely to be direct loss and fragmentation of habitat.

A further species, the Reed Parrotbill, is placed in the conservation category of *Near-threatened*. Although originally believed to have a very small and fragmented population, this species is now known to inhabit an extensive range in east and north-east China, east Mongolia, and the Lake Khanka region of south-east Russia. As with the Black-breasted Parrotbill, the main threats to its survival are associated with the mismanagement and clearance of its grassland, reedbed, habitat. In the case of this species, the over-harvesting of reeds, instead of a wildlife-sympathetic rotational method of reed-gathering, has been cited as a primary cause for concern. Others mentioned are the large-scale destruction of reedbeds for paper pulp and the reclamation of tidal lands for cultivation.

Notwithstanding the above, the most marked population fluctuations recorded for any parrotbill are those of the most widely distributed member of the family, the Bearded Parrotbill. This species' population in the East Anglia region of England was thought to number as few as 2–4 pairs in 1948, but by 1974 it had risen to 590 pairs; currently, the Norfolk population is in decline. In the Netherlands, 30,000–55,000 pairs of Bearded Parrotbills were estimated in 1965 and 1973, but only 700–1400 in 1983, this huge reduction thought to have been caused at least in part by loss of habitat. In 1989–1991, the Dutch population was estimated to number 1300–2000 pairs.

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PLATE 25

inches 4  
cm 10

## PLATE 25

## Family PARADOXORNITHIDAE (PARROTBILLS) SPECIES ACCOUNTS

### Genus *PANURUS* Koch, 1816

#### 1. Bearded Parrotbill

##### *Panurus biarmicus*

**French:** Panure à moustaches **German:** Bartmeise **Spanish:** Bigotudo  
**Other common names:** Bearded Tit/Tit-babbler, (Bearded) Reedling, Whiskered Tit

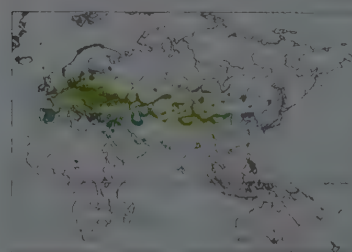
**Taxonomy** [*Panurus*] *biarmicus* Linnaeus, 1758, Europe = Holstein, north Germany. Range of plumage variation considered by some authors to be perhaps at least partly clinal, such that the species may be better treated as monotypic. Unclear whether populations of E Baltic (between Finland and Poland) belong to nominate race or *russicus*, which presumably intergrade in Poland and Slovakia and perhaps elsewhere in E Europe. Birds in E Turkey, Georgia and Armenia presumably like those from Azerbaijan, presently included in nominate; racial identity of those breeding in Syria uncertain, tentatively included in *kossigi*. Three subspecies currently recognized.

##### **Subspecies and Distribution**

*P. b. biarmicus* (Linnaeus, 1758) – breeds locally from England, France and S & E Spain E to S Norway, Denmark, S Sweden, S Finland, SW Russia, Balkans, W & S Turkey and Azerbaijan, non-breeding also S to Cyprus.

*P. b. russicus* (C. L. Brehm, 1831) – breeds S Lithuania, Poland and Belarus S to E Austria, NE Croatia, NE Bosnia-Herzegovina, N Serbia & Montenegro, N & E Bulgaria and C Turkey, E to S Russia (S from L Chany, SW Siberia and Tarbagatay, and S of L Baikal), Kazakhstan, Mongolia and N & NE China (Xinjiang, N Qinghai, W & NE Nei Mongol, Ningxia, NE Heilongjiang); non-breeding also Israel, N Iran (mainly Caspian coast), E China (N Hebei and SC Liaoning) and NE Afghanistan (may breed).

*P. b. kossigi* Kumerloewe, 1958 – S Turkey (area around Amik Gölü, at least) and NW Syria.



**Descriptive notes** 14–5, 17 cm; 11–20.8 g. The only sexually dimorphic parrotbill. Male nominate race has medium blue-grey or ash-grey forehead to nape, and sides of head and neck (from below eye backwards), often hint of darker lateral crownstripe, with black lores, neck and long moustachial and malar areas usually narrowly whitish bordered above lores and at rear; upperparts pale rufous-chestnut, outer scapulars buffier to buffish-white, inner scapulars with slight vinous-pink tinge. Flight-feathers and primary coverts dark brownish-grey to greyish-black, primaries P6–P9 and their coverts with narrow white outer fringes (forming distinct white panel on closed wing), P1–P5, P10, secondaries and other primary



coverts with rufous-chestnut outer edges (but white towards base of P1–P5), tips of secondaries and inner primaries narrowly fringed pink-cinnamon or cream-buff (inner webs more broadly so); outer two tertials black on shaft and outer web, white or cream-pink on inner web, innermost tertial largely white, tertial fringes pale rufous-chestnut to pink-cream; greater and median upperwing-coverts black with rufous-chestnut fringes (broadest on outer greater), lesser coverts mottled pale grey, buff and creamy white, alula black with broad white fringe along outer web; uppertail pale rufous-chestnut or cinnamon-chestnut with slight grey wash, tips of feathers T3 and T4 with slight pale ash-grey wash, tips and outer webs of T5 and T6 extensively pale ash-grey (whiter than T3 and T4) and with variable amount of black at base, some blackish often present also on outer fringes and tips of T3–T6 and occasionally on tips of T1 and T2; throat white to creamy, breast centre either white with faint grey wash or tinged vinous-pink, belly centre creamy buff, flanks as mantle and scapulars or slightly paler, undertail-coverts black; in worn plumage (spring and early summer), head duller grey (less bluish), mantle, scapulars and central rectrix paler (buffier), more cream and white of outer scapulars visible, uppertail-coverts more extensively vinous-pink, throat and centre of abdomen sometimes more extensively white to creamy (but belly side often less so), and tail tips heavily abraded; iris yellow or light orange-yellow, rarely dark brown, greyish-yellow or yellow-brown, generally brighter yellow-orange in spring; bill orange-yellow, orange-brown or bright orange; legs black, occasionally with brown or yellow-brown tinge, exceptionally bright yellow. Female has drab brown forehead to nape, often some black spots/mottling on centre, side or rear of crown (sometimes in pattern of two rough lateral crownstrips which coalesce on nape), occasionally completely streaked black (except for forehead and supercilium); upperparts similar to those of male but a little duller, usually some black streaks on lower mantle, inner scapulars and back, sometimes heavily streaked, the streaks coalescing to form black patch on lower mantle; lores mottled dull grey and pale buff, cheek and head side behind eye pale grey with variable vinous-pink tinge, ear-coverts and neck side tinged warm buff to variable extent, occasionally some black spots or shaft streaks on lower cheek; wings as male, but white fringes of outer primary coverts less pronounced and tinged buff, fringes along outer webs and tips of secondaries, tertials, inner primaries and greater upperwing-coverts slightly paler; tail as that of male, but generally slightly paler-tinged; underside as male, but vinous-pink tinge usually paler and less extensive, flanks paler (less rufous), abdomen centre often more extensively cream, undertail-coverts warm buff (not black); in worn plumage, slightly paler and greyer above, with more pronounced black markings (if present), uppertail-coverts extensively pale vinous-pink, largely dirty white below, with restricted pale vinous-pink on head side and upper flanks, pale buffy-brown lower flanks and undertail-coverts; bare parts as male, but iris yellow to reddish-amber in spring, bill yellow-brown, greenish-horn or grey-brown with yellow or yellow-orange cutting edges and lower mandible. Juvenile resembles female, but much buffier (less chestnut-tinged) above, on flanks and on central pair of tail feathers, has largely black lower mantle to back and rectrices T2–T6, blacker wings with pale fringes buffier and more restricted (those of P6–P9 creamy white), and duller underparts lacking vinous-pink tinge, young male with black lores, green-grey to yellow-green iris (week 3–6) becoming light yellow to orange around time of juvenile moult, bill yellow to orange, legs initially paler than adult, young female with lores dull grey with some buff mottling, bill horn-brown, grey-brown or blackish. Races vary mainly in depth of ground colour of head and body (both sexes) and in amount of black streaking on head and upperparts of female: *russicus* is paler than nominate, male crown pale blue-grey or pale ash-grey, mantle, scapulars and fringes of greater upperwing-coverts and secondaries more buffy rufous, mantle and scapulars sometimes tinged pink-grey, uppertail-coverts pale vinous-pink, female crown and upperparts only faintly streaked or unstreaked, underparts largely creamy white, buff tinge only on lower flanks and undertail-coverts, vinous-pink pale and restricted, juvenile has paler yellowish-buff base colour; *kossiwigi* is similar to nominate, but has darker and more rufous-brown upperparts and flanks, male rather dark grey on head and intense vinous-pink on breast and belly side, with uppertail-coverts deep vinous-pink, female with very little black streaking on mantle and scapulars. Voice. Male's song "tschindschik-tschrää" or "ts'chin-dschik-tschrää" lasting 2 seconds or slightly longer, with "tschrää" note harsher and second note shorter and softer than first, usually preceded by 3–5 introductory "tschin" notes (can be omitted if song quickly repeated); has also been described as "tschin-tik (tschri)-tschiuu", final note more drawn out and melodious, and as loud "chveen-chveen". Typical call a distinctive ringing "ping ping" or "tschin tschin"; plaintive "tuu" or "tjuu" notes from flocks often mixed with typical call; very soft "djipp" or "djupp" contact calls; soft "pitt pitt" in vicinity of nest, also "tze-tze-tze" or "tje-tje-tje" by parents contacting fledged young; when excited, utters harder "tjick" or "tschick", "tjipp" or "ticio", becoming sharper and more rapidly repeated as excitement increases; in alarm, scolding "t-tzääahh", "schra", "dschraahh" and "djschirr", as well as guttural "p/whut", plaintive "ee-ar, ee-ar" and churring "chirr-irr-irr-irr".

**Habitat.** Extensive reedbeds (*Phragmites*) and associated dense non-woody vegetation in and beside fresh and brackish water, or immediately adjoining marshes and swamps; tussocky edges of reedbeds; stands of reeds and bulrushes (*Typha*) in marshes and along shores of lakes and rivers. Vagrants have been recorded in wild sugar cane (*Saccharum*) and tamarisk (*Tamarix*) scrub. From sea-level to medium elevations; to at least 3050 m in China (Qinghai).

**Food and Feeding.** Feeds mainly on invertebrates and their larvae in summer breeding season; vegetable matter in late autumn and winter. Summer diet includes, among others, springtails (Collembola), mayflies (of family Polymitarcidae), damselflies (Zygoptera), stoneflies (Plecoptera), bugs (Hemiptera, including Veliidae, Delphacidae, Aphididae), moths (of family Noctuidae), caddis flies (Trichoptera), craneflies (Tipulidae), mosquitos (Culicidae), non-biting midges (Chironomidae), gall midges (Cecidomyiidae), soldierflies (Stratiomyidae), Hymenoptera, beetles (of families Halipidae, Dytiscidae, Hydrophilidae, Coccinellidae, Chrysomelidae, Curculionidae), spiders (Araneae) and slugs/snails (Gastropoda). Tends to catch relatively slow-moving insects, non-biting midges gathered from water's edge featuring frequently in diet. During breeding season, may be able to catch large numbers of larvae or pupae of various wainscot moths (Hadeninae), pale cream caterpillars of which feed within reed stems but emerge to pupate; these caterpillars can sometimes be identified at long distances as primary foods brought to a nest. In late autumn and winter, diet consists mainly of seeds (also plant fibres), including those of bulrushes, sedges (Cyperaceae), reeds and various other grasses (Gramineae) and rushes (Juncaceae); those of common reed (*Phragmites australis*) the most widely sought-after. Wandering flocks sometimes found away from reeds, and have been noted as taking seeds of knotgrasses (Polygonaceae), goosefoots (Chenopodiaceae), common nettle (*Urtica dioica*), great willowherb (*Epilobium hirsutum*), willows (*Salix*), mints (*Mentha*), and sometimes sea-buckthorn (*Hippophae rhamnoides*). Diet of dependent young lacks plant material, but becomes more varied soon after independence. Forages in pairs and family parties, and in post-breeding flocks of up to 40–50 or even 200 or so. Feeding areas are typically near standing water, well separated from nesting areas; often feeds at base of reeds, forages also on muddy ground and at margins of open water. Regularly climbs to top of reed

stems and flies short distances above reeds. Searches broken and cracked stems, and makes rapid darting movements to catch passing insects; sometimes hangs upside-down when feeding, and sometimes uses its bill or foot to pull a seedhead closer. Draws parts of reed-heads through its bill while nibbling to extract seeds. Hops and runs quickly on the ground, scratching earth and turning over reed leaves in search of food. In cold weather, feeds on fallen seeds and even probes snow.

**Breeding.** Season late Mar to early Sept in W Palearctic; regularly 2–4 broods. Monogamous, but bigyny also reported. Nest built by both sexes, a deep cup-shaped structure of dead reed blades and other marsh-plant leaves, lined with flowering reed-heads, usually also feathers and occasionally mammal hair (lining material often added through egg-laying and even incubation periods), nearly always roofed by sheltering vegetation, outer diameter 8–15 cm, height 6–23 cm, inner diameter 6–6.8 cm, cup depth 5–5.8 cm; placed 5–72 cm up (those above water typically higher) among close-growing and typically more or less vertical stems of reeds, sedges and other marsh vegetation, exceptionally built into rim of heron (Ardeidae) nest; artificial nests accepted. Clutch 3–11 eggs, usually 4–8, smooth and glossy, white to creamy, lightly and finely streaked and speckled dark brown, dimensions 14.5–19.7 × 12.4–15.1 mm; incubation by both sexes, period 10–14 days; chicks cared for by both parents, nestling period usually 12–13 days, sometimes up to 16 days, young may leave nest at 10 days if disturbed, and apparently typically leave before able to fly; rarely dependent for more than two weeks after having left nest.

**Movements.** European populations mainly fairly sedentary, but subject to eruptive post-breeding and wintering movements, sometimes resulting in establishment of new colonies; other erupting individuals return to source site to breed in following spring. Birds which leave breeding grounds for winter depart Sept–Nov (mainly Oct) and return Mar–May. Rapid increase in breeding population of the Dutch polders during 1950s and 1960s resulted in major irruptions during 1960s and 1970s across NW Europe. Vagrants of nominate race recorded in Republic of Ireland (bred 1976–1985, at least) and N Africa (Morocco, Algeria), and of race *russicus* in Kuwait, Pakistan, Korea and Japan; erratic winter visitors to Syria not identified subspecifically.

**Status and Conservation.** Not globally threatened. Generally fairly common to common in places where established as a breeding species. Breeding numbers, however, may show regular annual fluctuations, and have probably always risen and fallen locally, to a considerable extent. Range currently expanding in much of Europe; has increased in some areas after an earlier decline, as well as colonizing new areas. Population is likely to increase further where winter weather conditions are becoming milder. In other regions (e.g. Turkey), breeding population thought to be decreasing, primarily as a result of drainage of marshland habitat. In S Turkey, race *kossiwigi* has never been collected outside area around Amik Göldü, where it was present until at least 1956 but was apparently extinct by 1962.

**Bibliography.** Abdullali (1983), Adamian & Klem (1997), Ali & Ripley (1996), Anon. (1998b), Aulén (1996), Bannerman & Bannerman (1958), Beaman & Madge (1998), Bibby (1983), Bories *et al.* (2000), Bradshaw (2000), Bradshaw & Kirwan (2000), Brazil (1991), Cai Qikan (1987), Cheng Tsohsin (1987), Cramp & Perrins (1993), Deignan (1964c), Dementiev *et al.* (1954, 1970), van den Elzen (1993), Eskelin & Tolvanen (1999), Etchecopar & Hue (1983), Evans (1994), Flint & Stewart (1992), Flint *et al.* (1984), Gorman (1996), Grimmett & Taylor (1992), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Hartert (1907), Harvey (1986), Hornskov (1989, 1995), Hutchins (1989), Inskipp *et al.* (1996), Jordans & Steinhilber (1948), Kirwan (1998), Kirwan & Martins (1994), Kumerloewe (1958, 1963, 1969), Lack (1986), Lee Woo-Shin *et al.* (2000), Meyer de Schauensee (1984), Murdoch *et al.* (2004), Pfister (2000), Porter *et al.* (1996), Rasmussen & Anderton (2005), Ripley (1982), Rogacheva (1992), Roselaar (1995), Sien Yaohua *et al.* (1964), Sluys (1982, 1983), Spitzer (1972, 1973), Tavares *et al.* (2000), Tomialojc & Stawarczyk (2003), Vaurie (1959, 1972), Wawrzyniak & Sohns (1986), Williams (1994).

## Genus CONOSTOMA Hodgson, 1841

### 2. Great Parrotbill

#### *Conostoma aemodium*

French: Grande Panure German: Riesenpapageimeise Spanish: Picoloro Grande

**Taxonomy.** *Conostoma* [sic] *Emodium* [sic] Hodgson, 1841, northern Nepal.

Original description included two different spellings of genus name (*Conostoma*, *Conostama*) and three of species name (*aemodium*, *aemodius*, *omodius*); both elements of current name determined by ICZN Principle of First Reviser. Genus name has been claimed to be preoccupied by the name of an insect genus, with replacement name *Emendrodzovoma* proposed; however, several significant uncertainties surround this claim, and so long-established and almost universally used current name should be retained until satisfactorily proven otherwise. Monotypic.

**Distribution.** Himalayas from N India (E Uttaranchal Pradesh) E to E Bhutan, and locally in adjacent areas of S Xizang (S China); also, disjunctly (on basis of present knowledge), in C China (SW Shaanxi and S Gansu S to Sichuan and NW Yunnan) and E part of N Myanmar.

**Descriptive notes.** 27.5–28.5 cm; c. 88–110 g. Adult is much larger than other parrotbills, and relatively long-billed. Forehead is greyish-white, fading onto crown; otherwise, mousy greyish-brown with faint warm tinge above, slightly greyer on crown, rump and uppertail-coverts; lores and orbital area blackish-brown, head side similar in colour to upperparts; flight-feathers dark grey with buffish-cream inner fringes, primaries P5–P10 have pale ash-grey outer fringe towards tips (after emargination), becoming greyer towards base, and tinged with colour of upperparts close to base, inner primaries mid-grey on outer webs and washed

with colour of upperparts; strong rufescent wash over outer webs of secondaries and tertials, extending just to innermost primaries; tail medium grey, becoming similar in colour to upperparts towards centres of feathers; mostly ashy grey below, with vague paler and darker streaks on throat to ear-coverts, flanks with wash of similar colour to that of upperparts (or a shade greyer); iris pale yellow or pale orange-yellow to ochre-brown; bill orange-yellow, yellow at tip of upper mandible,



Has sometimes been placed in a genus *Psittiparus*, along with *P. ruficeps*. Until recently considered conspecific with *P. margaritae*, but the two differ somewhat in morphology, plumage and voice. Birds in parts of S China of uncertain racial identity, those in W & NW Yunnan presumed to belong with *translivialis* and those in S Yunnan and SW Guangxi with *laotianus*. Former race considered of doubtful validity by some authors, and may be better merged with nominate. Likewise, *laotianus* differs only slightly from *fokienensis* and perhaps better synonymized with it. Six subspecies currently recognized.

**Bibliography.** Collar (2003, 2006), Deignan (1964c), Delacour (1927, 1929), Delacour & Jabouille (1931b), Eames (1995), Eames, Trong Trai & Nguyễn Cu (1995), King *et al.* (1975), Robson (2000, 2005b), Robson *et al.* (1993b).





7

8

9

10

*ssp brunneus*

*ssp styani*

11

12

13

14

*ssp ricketti*

15

*ssp albifacies*

*ssp fulvifrons*

*ssp humii*

*ssp morrisonianus*

17

*ssp pallidus*

*ssp ripponi*

*ssp nipalensis*

16

*ssp beaulieu*

*ssp verreauxi*

*ssp poliotis*

18

*ssp heudei*

*ssp polivanovi*

*ssp oatesi*

19

20

21

*ssp atrosuperciliaris*

PLATE 26

inches 3  
cm 8



## 7. Black-breasted Parrotbill

### *Paradoxornis flavirostris*

**French:** Paradoxornis de Gould

**German:** Schwarzkehl-Papagei

**Spanish:** Pícoloro Pechinegro

**Other common names:** Gould's Parrotbill

**Taxonomy.** *Paradoxornis flavirostris* Gould, 1836, probably Nepal (north West Bengal, India, later considered more likely).

Formerly treated as conspecific with *P. guttaticollis* by some authors, but is morphometrically quite distinct and differs in vocalizations and, especially, in habitat requirements; ranges of the two overlap (or formerly overlapped) in parts of NE India, but they are ecologically separated. Monotypic.

**Distribution.** R Brahmaputra floodplains in NE West Bengal, NE Assam and immediately adjacent areas of Arunachal Pradesh, in NE India. Contrary to some published reports, not present on Mt Victoria (W Myanmar).



**Descriptive notes.** 19.5–21 cm. Has forehead to nape chestnut-brown, lores and ear-coverts blackish with variable white mottling below eye, neck side (area behind ear-coverts) chestnut; upperparts rufescent brown; flight-feathers and tertials dark brown with creamy-buff inner fringes, dark rufous outer fringes, outer edges of most primaries paler and duller towards tips; upperwing-coverts dark brown, outer fringes similar in colour to upperparts; uppertail dark brown, outer fringes brighter; chin to upper breast mostly black, variable white mottling on throat; underparts deep rufescent-buff; iris deep red or red-brown to olivaceous brown; bill wax-yellow to bright or deep yellow; legs slate-coloured to plumbeous grey. Distinguished from similar *P. guttaticollis* by darker and more chestnut forehead to nape, blacker lores, more chestnut-tinged rear neck side, mostly black chin to upper breast, and much darker and warmer underparts. Sexes alike.

**Behaviour.** Juvenile is richer rufous above, with duller bill. **Voice.** Song, given often from any exposed perch (e.g. tall reed stem), of 4–7 clear, quite high notes, e.g. "woi-woi-woi-woi-woi" or "wui-wui-wui-wui-wui" or "whii-whii-whii-whii", and huskier "jhor-jhor-jhor-jhor-jhor" or "jhui-jhui-jhui-jhui-jhui"; these vocalizations sometimes accompanied by antiphonal worried-sounding "er-er-er-er-er-er" or "uu-uu-uu-uu-uu", and slow "whittittittit" (possibly from female). Other calls include clear, rather high "wu, wi, wi" and "wu, wi, wi, wii" ("wu" notes lower) mixed with low, slightly nasal "uh-uh-uh-uh-uh".

**Habitat.** Tall mixed grassland, including ekra (*Erianthus ravanee*) and wild sugar cane (*Saccharum*), along riverbanks and seasonally inundated riverbeds; possibly also frequents bamboo and wild cardamom in some areas. Restricted to plains level; formerly occurred as high as 915 m.

**Food and Feeding.** Diet consists of a mixture of small invertebrates and seeds. Various insects, including earwigs (Dermaptera) and beetles (Coleoptera), and their larvae (particularly during breeding season); also berries. Forages in small parties of up to twelve individuals, often 7–8, during non-breeding season. Fairly shy. Often keeps low down, close to ground, when foraging, but periodically ascends to tops of reed or grass stems (particularly when calling). Obtains food from cracks and crevices in reeds and various grasses; makes loud noises when nibbling at flowers of these plants.

**Breeding.** Mar–Jul. Nest a very neat, compact deep (rarely shallow) cup constructed from fine strips/shreds of bark or coarse grasses and bamboo leaves (occasional dead leaves), bound with cobwebs (rarely, fine elastic twigs), lined with fine pieces of grass, bark and occasionally hair (nest is of a bright, clear yellowish colour, blending perfectly with surroundings), external diameter 8.4–10.2 cm, height 6.4–7.6 cm, internal diameter 6.3 cm, depth 5.1 cm; placed 1–3 m above ground, usually fixed to three or four reed stems or in cluster of twigs jutting out from a bamboo node, exceptionally in a sapling. Clutch 2–4 eggs, smooth, sometimes faintly glossed, usually very pale greenish-white, sometimes tinged brownish or yellowish, or almost white, scantily marked with minute freckles to large blotches of pale amber or olive-brown over paler undermarkings of same colour and a few short twisted lines of dark amber (one clutch described as showing a few very faint pinkish/purplish-brown specks at larger end), average dimensions 21.9 × 16.2 mm. No other information.

**Movements.** Sedentary.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Assam Plains EBA. Rare to uncommon, and local. Formerly more widespread, and once occurred also from NE Bangladesh E to plains of Cachar, in S Assam. Despite some published statements, is not present on Mt Victoria, in W Myanmar. Population size unknown but, in view of paucity of recent records and the widespread reduction in area of its habitat, it is believed to be declining. Historically in Indian Subcontinent, was regarded as fairly common in Assam (including Cachar) to rare in the Bhutan duars. The few recent sightings have come from Assam, where extensive habitat remains for the species in Dibru-Saikhowa National Park and, to lesser extent, Kaziranga National Park; recent records also from Jaldapara Wildlife Sanctuary (West Bengal), and D'Ering Memorial Wildlife Sanctuary (Arunachal Pradesh). In Bangladesh, was formerly scarce to uncommon along R Kushiara, although earlier authors suggested that it was rather common in Sylhet and regularly encountered when travelling by boat through this district; no extensive patch of tall grassland remains in Bangladesh, and surviving fragments generally heavily used and harvested up to three times a year for fodder, thatching and building materials; reedbeds of NE Bangladesh were leased out for paper production in 20th century, and reported to have been entirely destroyed. Primary threat is loss and degradation of habitat. Huge areas of grassland throughout this species' former range have been converted to agriculture and forestry plantations, others have been modified as flooding regimes have been changed by dam and irrigation schemes, and many remaining grasslands are overgrazed by domestic livestock and intensively harvested by local communities (often associated with burning). In many areas, grasslands of conservation value are virtually confined to protected areas, but here, too, they continue to suffer degradation. Grasslands are generally poorly represented in protected-area systems, although in Assam there is a preponderance of grassland in protected areas and a shortage of forest. Even in the Brahmaputra floodplain in Assam, however, the state and local distribution of this habitat can be altered by annual flooding.

**Bibliography.** Abdulali (1983), Ali & Ripley (1996), Anon. (2006d), Butchart & Stattersfield (2004), Collar *et al.* (2001), Deignan (1964c), Harvey (1990), Inskipp & Inskipp (1991), Inskipp *et al.* (1996), King *et al.* (1975), McArthur (2006), Rasmussen & Anderson (2005), Ripley (1982), Singh (1995), Smythies (1940), Stattersfield & Capper (2000), Stevens (1914), Stuart Baker (1893, 1922).

## 8. Spot-breasted Parrotbill

### *Paradoxornis guttaticollis*

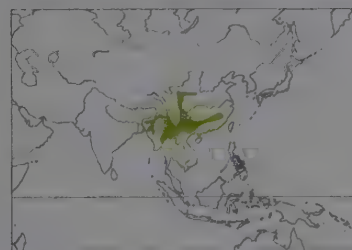
**French:** Paradoxornis fléché **German:** Brustflecken-Papagei **Spanish:** Pícoloro Pechipinto

**Other common names:** White-throated/Spotted-breasted/Rufous-headed Parrotbill

**Taxonomy.** *Paradoxornis guttaticollis* David, 1871, western Sichuan, China.

Formerly treated as conspecific with *P. flavirostris* by some authors, but is morphometrically quite distinct and differs in vocalizations and, especially, in habitat requirements; ranges of the two overlap (or formerly overlapped) in parts of NE India, but they are ecologically separated. Proposed race *gongshanensis* (from W Yunnan, in S China) considered of very dubious validity. Treated as monotypic.

**Distribution.** NE India (Himalayas of extreme E Arunachal and hills S of R Brahmaputra), W, N, E & S (E part) Myanmar; N part of NW Thailand, N Laos, N Vietnam (W & E Tonkin) and C, S & SE China (S Gansu and S Shaanxi S to WC Sichuan and Yunnan, E through Guizhou, N Guangxi and N Guangdong to N Fujian).



**Descriptive notes.** 18–22 cm; male 28–40 g, female 26.5–35 g. Has rufous crown and nape, very slightly buffier forehead, and rufescent-brown upperparts; lores mostly black with buffish-white to pale buff admixed, prominent large blackish ear-covert patch (including lower moustachial/malar area), buff neck side behind ear-coverts; upperwing dark brown, darker on inner webs, flight-feathers and tertials with creamy-buff inner fringe, dark rufous outer fringes (warmer than upperparts, but not so bright as crown), outer edges of primaries P2–P8 paler and duller towards tips (after emargination); upperwing-coverts and

uppertail dark brown, with outer fringe brighter (similar in colour to upperparts); cheek to throat side and area just behind eye pale buff to buffish-white with greyish streaks, mottling or speckles; remainder of underside buff to pale buff, with mostly blackish chin, and sooty inverted chevrons or streaky spots on throat and upper breast; iris brown to red-brown or chestnut; large, short and very deep-based bill bright yellow, orange-yellow or wax-yellow, tip sometimes browner; legs slaty, bluish-grey or greenish-plumbeous. Sexes alike. Juvenile is similar to adult, but has paler crown, more rufescent upperparts and wing and tail fringing, and more buff-tinged underparts. **Voice.** Song, from exposed perch, e.g. top of tall grass stem, a loud staccato series of usually 3–7 notes, repeated every 1.5–1.5 seconds, "whit-whit-whit-whit..." and jollier "wui-wui-wui-wui", "whi-whi-whi-whi", "dri-dri-dri-dri-dri" and "tui-tui-tui-tui-tui", or shorter strident "du-du-du", when excited, may give longer "ju-ju-ju-ju-witwitwitwit witwitwitwitwitwit" or "ju-ju-ju-ju-witwitwitwitwitwit...", starting with hurried rising notes and culminating in thin, higher-pitched, quite metallic ones; also gives introductory series alone, and makes coarse sounds (harsher than similar territorial calls), as "ee-cho-cho-cho-cho", "chow-cho-cho-cho-cho-cho", "jieu-jieu-jieu-jieu" and "ju-ju-ju-ju-dui-dui" and so on. Contact calls include low "ruk-ruk", "ruk-uk-uk", "rut-rut-rut-rut", "chi-cho-cho" and sibilant "chu-chu" and "chut-chut-chut".

**Habitat.** Grass and scrub, abandoned cultivation, and bamboo. Occurs at 900–2100 m in India, 1050–2135 m in SE Asia, and 350–3250 m, possibly to 3355 m, in China.

**Food and Feeding.** Diet insects and their larvae, seeds and berries; seeds include those of cultivated millet (*Panicum*). Forages in small parties; occasionally joins bird waves, which may contain such timioid species as Rufous-necked Laughingthrush (*Dryonastes ruficollis*) and harwings (*Actinodura*). Breaks open grass stems in search of food.

**Breeding.** Apr–Jul. Thought to be strongly territorial during breeding season, at least; sings frequently. Nest a very compact and deep cup-shaped structure, made from soft yellowish and other grasses, and bamboo leaves, usually plastered with cobwebs, and lined with finer yellowish (sometimes darker) strips of grass, internal diameter c. 5.1 cm and depth c. 6.3 cm; situated 0.9–1 m, sometimes to 3–7 m, above ground in reeds, bamboo clump, shrub or among stout weeds. Clutch 2–4 eggs, smooth and slightly glossy, variably patterned, one variety described as pale green-grey with numerous but faint blotches and smudges of sepia and brown and underlying spots of lavender and a few dark brown scrawls (said to be indistinguishable from those of *P. flavirostris*), in Myanmar and China said to be white or whitish with sparse speckles or spots and often hair-lines of pinkish-brown, buffy red and often various shades of lilac and grey, dimensions 22.1–23.5 × 15.8–16.5 mm (one from China 22.5 × 17 mm). No other information.

**Movements.** Sedentary; possibly performs some very local and minor altitudinal movements in China.

**Status and Conservation.** Not globally threatened. Very widespread, and generally fairly common in favourable habitat.

**Bibliography.** Abdulali (1983), Ali & Ripley (1996), Anon. (1980a, 2002a), Bangs & Van Tyne (1931), Bingham (1903), Bourret (1944), Caldwell & Caldwell (1931), Cheng Tsohsin (1984), Cheng Tsohsin, Tan Yaokuang & Li Yunhsin (1965), Cheng Tsohsin, Tan Yaokuang, Liang Chunyu & Chang Chunfu (1963), Choudhury (2001), Davidson (1998), Deditius (1897), Deignan (1963, 1964b), Delacour & Jabouille (1931b), Dowell *et al.* (1997), Greenway (1933), Hopwood & Mackenzie (1917), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskipp *et al.* (1996), King & Han Lianxian (1991), King *et al.* (1975), Kinnear (1929), Kraaijeveld (1995), La Touche (1899, 1923, 1925–30), Laurie *et al.* (1986), Lekagul & Round (1991), Lewthwaite (1996), Li Guiyuan *et al.* (1976), Liu Kezhier *et al.* (1994), McArthur (2006), Meyer de Schauensee (1984), Nguyen Duc Tu *et al.* (2001), Oates (1994), Rasmussen & Anderson (2005), Ripley (1952, 1982), Robertson, A. (1999), Rothschild (1923, 1926), Singh (1995), Smith *et al.* (1943), Smythies (1940, 1949), Stanford & Ticehurst (1938), Stone (1933), Stott (1993), Stresemann (1923c), Stresemann & Heinrich (1940a), Stuart Baker (1893, 1901, 1922), Styan (1891), Tan Yaokuang & Cheng Tsohsin (1964), Fizard *et al.* (1997), Jordoff *et al.* (2002), Traylor (1967), Uchida & Kuroda (1916), Wu Zhikang *et al.* (1986), Yen Kwokying (1934b), Zhang Quntan *et al.* (1994)

On following pages: 9. Spectacled Parrotbill (*Paradoxornis conspicillatus*); 10. Vinous-throated Parrotbill (*Paradoxornis webbianus*); 11. Brown-winged Parrotbill (*Paradoxornis brunneus*); 12. Ashy-throated Parrotbill (*Paradoxornis alphonisianus*); 13. Grey-hooded Parrotbill (*Paradoxornis zappayi*); 14. Rusty-throated Parrotbill (*Paradoxornis przewalskii*); 15. Fulvous Parrotbill (*Paradoxornis fulvifrons*); 16. Black-throated Parrotbill (*Paradoxornis nipalensis*); 17. Golden Parrotbill (*Paradoxornis verreauxi*); 18. Short-tailed Parrotbill (*Paradoxornis davidianus*); 19. Lesser Rufous-headed Parrotbill (*Paradoxornis atrosuperciliaris*); 20. Greater Rufous-headed Parrotbill (*Paradoxornis ruficeps*); 21. Reed Parrotbill (*Paradoxornis heudei*).



## 9. Spectacled Parrotbill

*Paradoxornis conspicillatus*

**French:** Paradoxornis à lunettes **German:** Brillenpapagei **Spanish:** Pícoloro de Anteojos  
**Other common names:** Spectacled Crowtit

**Taxonomy.** [Suthora] *conspicillata* David, 1871, easternmost Kokonor [= Qinghai Hu], China. Sometimes placed together with *P. webbianus*, *P. brunneus*, *P. alphonisianus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Race *rocki* not very distinct (slightly thicker bill was greatly exaggerated in the text figure in type description), and supposedly paler plumage and lighter brown head not discernible on museum specimens examined; species may be better treated as monotypic. Two subspecies tentatively recognized.

**Subspecies and Distribution.**

*P. c. conspicillatus* (David, 1871) – C China from E Qinghai E to S Gansu, NC & NE Sichuan and S Shaanxi, China.

*P. c. rocki* (Bangs & J. L. Peters, 1928) – W Hubei, in EC China.



**Descriptive notes.** 14–15 cm; 8–9 g. A relatively small and long-tailed parrotbill, recalling *P. webbianus*. Has forehead to nape dull chestnut-brown, merging into colour of upperparts on centre of upper mantle; lores to cheek sooty-coloured, offsetting prominent white eyering; upperparts greyish olive-brown with buff tinge, becoming slightly buffier on uppertail-coverts; flight-feathers and tertials dark greyish-tinged brown with creamy-buff inner fringe, upperwing-coverts and outer fringes of tertials and flight-feathers similar in colour to upperparts, outer fringes becoming paler and more ashy-coloured towards tips (after emargination) of all

primaries except P9 and P10 (sometimes along most of length of outer fringe and extending to outer secondaries); tips of all remiges also paler and more ashy-coloured; tail drab greyish-brown; ear-coverts and neck side vinous-brown, throat and upper breast pinkish-grey to pinkish-brown (paler pinkish-cream centre) with quite broad sooty-brown streaks, remainder of underparts similar to upperparts but paler and a little buffier; iris brown; bill yellow to yellowish-white; legs grey-brown. Sexes alike. Juvenile is darker and more uniform above than adult, with slightly more rufescent upperparts, uppertail and wings, has slightly less pronounced throat and breast streaking, slightly darker and warmer lower underparts, and considerably narrower bill. Race *rocki* differs from nominate only in slightly thicker bill and apparently very slightly larger overall size. Voice. Song a very thin, high, piercing, penetrating series of 4–5 notes, “tsiu-tsiu-tsiu-tsiu”, “ssiu-tsiu-tsiu-tsiu” or “hsiu-tsiu-tsiu-tsiu”, slightly rising, repeated after medium to longish intervals. Typical calls varied, slightly buzzy, mechanical-sounding, e.g. “trrr-trrr-trrr” (rising, falling, rising); when alarmed, harsher, shriller “trrrh”, “trrrh”, “trrii” or “drrri” notes, doubled or in repetitive series, “trrii-trrii-trrii-trrii-trrii...”; also “trrrh-trrrh-trrrh” (with thinner, even shriller end note) and “trrrh-tih” or “trrrh-trrii” (with buzzy second note); contact calls include spaced “tip” notes.

**Habitat.** Mixed broadleaf scrub, dense prickly oak (*Quercus*) mixed with willows (*Salix*) and other trees, scrub and secondary growth in open forest and along its edge; sometimes reedbeds in or near forest or bamboo. Recorded at 1000–3300 m.

**Food and Feeding.** No information on diet. Usually in small flocks of up to 15 individuals, sometimes as many as 40, outside breeding season. Forages at low level in vegetation.

**Breeding.** Season Jun–Aug. Observation of food-carrying by both members of a pair suggests that young are fed by both sexes. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Not well known. Has rather limited range in C China, where generally considered to be rather uncommon. Recorded regularly at Wolong Nature Reserve, in C Sichuan, and Jiuzhaigou Nature Reserve, in NC Sichuan; present also in Foping Panda Reserve, in Shaanxi.

**Bibliography.** Anderson (2003), Appleby *et al.* (1989), Bangs & Peters (1928), Cheng Tsohsin *et al.* (1965), Dedičius (1897), Deignan (1964c), Hanert (1907), Hornsø (1999), Inskipp *et al.* (1996), Laurie *et al.* (1986), Massie & Massie (1997), Meyer de Schauensee (1984), Sien Yaohua *et al.* (1964), Stresemann (1923c), Thayer & Bangs (1912), Vaurie (1972), Yu Zhiwei *et al.* (1986), Zheng Xuoxin & Qian Yanwen (1973).

## 10. Vinous-throated Parrotbill

*Paradoxornis webbianus*

**French:** Paradoxornis de Webb **German:** Braunkopf-Papagei **Spanish:** Pícoloro de Webb  
**Other common names:** Webb's Parrotbill, Webb's/Rufous-headed/Brown Crowtit

**Taxonomy.** *Suthora webbianus* Gould, 1852, Shanghai, Jiangsu, China.

Sometimes placed together with *P. conspicillatus*, *P. brunneus*, *P. alphonisianus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Considered conspecific with *P. brunneus* and, especially, *P. alphonisianus* by some authors. Where range overlaps with that of latter, the two species are sometimes found in mixed flocks in which occasional hybrids reported, e.g. in Vietnam (near Sa Pa, in W Tonkin), and hybrids seen also in NW Italy (where both species introduced); in China, interbreeding reported in 1938 in C Sichuan, and a number of earlier specimens from that region were considered to present a range of features intermediate between the two species, but insufficient details available. Race *suffusus* poorly marked, perhaps better united with nominate; *elisabethae* doubtfully distinct from *suffusus* (exact SW geographical limits of which are unclear), and the single type was a specimen in full moult (colour, which varies considerably with wear, an unsatisfactory character for racial diagnosis). Entire Korean population included in race *fulvicauda*, but those in extreme N possibly belong with *mantschuricus*. Six subspecies currently recognized.

**Subspecies and Distribution.**

*P. w. mantschuricus* (Taczanowski, 1885) – extreme SE Russia (S Ussuriland) and NE China (E Heilongjiang S to NE Hebei).

*P. w. fulvicauda* (C. W. Campbell, 1892) – E China (W & S Hebei) and Korea.

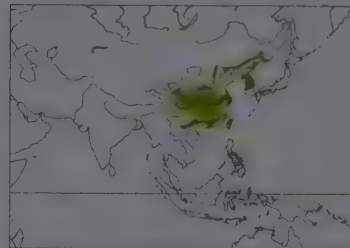
*P. w. suffusus* (Swinhoe, 1871) – C & SE China (S Gansu, S Shaanxi, C & E Sichuan, E Guizhou and Guangxi) to S Shanxi, inland S Jiangsu, W Fujian and Guangdong) and extreme N Vietnam (NW part of N Tonkin).

*P. w. webbianus* (Gould, 1852) – coastal Jiangsu and N Zhejiang, in E China.

*P. w. elisabethae* (La Touche, 1922) – extreme S China (SE Yunnan) and extreme N Vietnam (N part of W Tonkin).

*P. w. bulomachus* (Swinhoe, 1866) – Taiwan.

Introduced in Europe (NW Italy).



**Descriptive notes.** 11–12.5 cm; male 8.5–11 g, female 7–12 g (*suffusus*, *fulvicauda*, *mantschuricus*). A relatively small and long-tailed parrotbill. Nominative race in fresh plumage (Nov.) has rufescent-brown forehead to crown merging with upperpart colour on nape/uppermost mantle, lores buffier than crown; upperparts warm-tinged mid-brown, slightly buffier on uppertail-coverts; flight-feathers and tertials dark brown with buffish-cream inner edges, outer fringes of secondaries and primaries strongly rufous-chestnut, paler and buffier on last two-thirds to three-quarters of fringe (towards tip) on primaries P7–P9, then gradu-

ally decreasing towards feather tips on inner primaries, outer fringes of tertials buffier than those of secondaries; upperwing-coverts appear roughly intermediate in colour between upperparts and wings; uppertail dark brown, with outer feather fringes similar in colour to upperparts (particularly towards bases); ear-coverts to throat and upper breast pinkish-cream with rather faint warmish brown streaks, flanks and undertail-coverts similar in colour to upperparts but paler and buffier, abdomen centre more buffish-cream and merging with breast colour; iris brown to pale grey; bill dark slate coloured with lighter tip of lower mandible, or brown with yellow tip; legs greyish-brown. Sexes alike. Juvenile is darker and more uniform above than adult, with less bright and contrasting crown, slightly warmer upperparts, plainer and buffier underparts with less pink and less obvious streaking. Races differ mainly in tone of colours: *suffusus* is slightly brighter than nominate, more rufous-chestnut on crown to uppermost mantle, a shade colder/darker above, perhaps slightly warmer and more intense vinous-pink below; *elisabethae* is similar to previous, but with somewhat darker and more chestnut forehead to uppermost mantle, somewhat duller throat and upper breast with less distinct streaks, and buffier belly (also, bill described as dull greyish and legs as bluish dusky-pink or reddish-tinged dull greyish); *bulomachus* is also very similar in appearance, but has considerably larger bill (supposed paler rosy head side contrasting with pinkish rufous-chestnut crown, and very pale throat, not obvious on museum specimens examined); *fulvicauda* has pinkish of underparts very slightly stronger, and reaching farther down towards belly, rufescent brown of nape possibly more chestnut and may extend farther onto upper mantle; *mantschuricus* is noticeably paler overall, with less obvious streaking on head side and throat, weaker pink tinge below. Voice. Song (race *fulvicauda*) can be transcribed as “rit-rit chididi tssu-tssu-tssu” or “ri rit ri chididi wii-tssu-tssu” (2–5 soft quick introductory notes, then very rapid “chididi”, and finally loud high, thin stressed notes). Flocks call with subdued rapid chattering, interspersed with occasional thin, high piercing “tsiu-tsiu” or “tiu-tiu” (*elisabethae*), and chuntering “chr’rr’rr” and “chur’ir’it” etc.; more scolding calls when agitated, e.g. “wutitit”, and “wutitich’it’it’it’it” (*suffusus*).

**Habitat.** Scrub, thickets, secondary growth, forest edges, early successional stages to relatively mature secondary woods, also hedges, bamboo groves, reeds, marshes, tea plantations, and plant nurseries. In most of Chinese range occurs only to 1400 m, and mainly below 1000 m in Sichuan, where replaced at higher levels by *P. alphonisianus*; 600–2000 m in S & SE China. Found at up to 1500 m in Vietnam. Reaches highest elevations in Taiwan, where recorded to 3100 m and thought possibly to occupy the widest niche of any bird species.

**Food and Feeding.** Feeds mainly on seeds, flowers, fruits and buds; also insects and their eggs, including locusts (Orthoptera) and caterpillars of geometrid moths (Lepidoptera). Insect food constituted only 37% of diet during studies in Taiwan, where individuals were seen to pick at leaves or stems of 40 different plant species. Lives in fast-moving flocks, which change in size according to season, small in Apr–Jun, middle-sized in Aug–Sept, large in Oct–Jan (up to 140 birds in Korea), and middle-sized in Feb–Mar; found in pairs from Mar to Aug (breeding season). Primarily an understory-dweller, but will ascend to canopy of small trees in search of certain flowers and seeds. In Taiwanese studies, this species spent 85% of its waking time in foraging or feeding.

**Breeding.** Apr–Aug; multi-brooded, often two broods during one season. Monogamous; duties of nest-building, incubation of eggs and rearing of young shared more or less equally by the two sexes. Nest, constructed during period of 1–4 days, a neat and fairly stiff, deep cup-shaped structure (rounded or oblong) made from coarse and fine grasses, strips of rush (*Juncaceae*) leaves, dry bamboo or other leaves, culled *Stephanandra* (*Stephanandra incisus*) bark (S Korea), plant fibres, strips of whitish reed skin, dry twigs and fine roots, sometimes wrapped in long soft moss and/or plastered with cobweb where available, lined with fine grass stems, very fine grass blades, cow fibre, hair, feathers and the like (Korean nests apparently never have feathers or mammal hair in lining), the rim often well finished-off and plastered with cobweb; external diameter 6–11 cm, height 6–12 cm, internal diameter 4–6.5 cm, depth 4–1–9 cm, second-brood nests apparently on average smaller (though similar in shape) than first-brood ones; situated 30 cm to 3 m (mostly 40–90 cm) above ground among reeds, small bamboos, nettles (*Urtica*), climbing plants, or in fork of bush, including tea (*Camellia sinensis*), or small tree (141 nests in S Korean surveys were built in 28 different plant species, including trees, shrubs, herbs and grasses). Clutch 3–7 eggs (usually 5–6 in S Korea, 4–5 in China and Taiwan), first egg laid on day following nest completion or several days thereafter, eggs smooth and slightly glossed, morphologically variable, azure to turquoise-blue, bluish-white or white, dimensions 15.5–16.7 × 11.7–12.7 mm (*elisabethae*), 14.2–17 × 11.2–13 mm (*suffusus*), 16–17.8 × 12.3–13 mm (*fulvicauda*), 14.9–16.4 × 12.2–12.8 mm (*mantschuricus*), and average 16.5 × 13.2 mm (*bulomachus*, eggs of which described as slightly darker and much broader than those of other races); apparently, *mantschuricus* and *bulomachus* lay only blue-type eggs, and blue-green eggs of *fulvicauda* said to be bigger than white ones and were typically the most common type found during surveys in S Korea (although the ratio varied from site to site); incubation period 13–15 days, typically 14 days, hatching largely synchronous (of 57 broods studied in S Korea, 82.4% hatched completely within 24 hours, 15.8% within 48 hours, 1.8% after 48 hours); chicks leave nest after just 9–10 days, having attained c. 80% of adult body weight but only 60% of adult wing length. Nests commonly parasitized by Common Cuckoo (*Cuculus canorus*), e.g. 5.3% of nests at study sites over four seasons in S Korea; cuckoo's eggs are always of a blue type but larger than those of host, and host rejected more than 60% of cuckoo eggs when laid in blue-egg clutches and 100% when laid in white-egg clutches.

**Movements.** Some cold-weather movements recorded for race *mantschuricus* in Changbai Mts, in SE Jilin (NE China), where said to depart in late Sept and return in late Apr; according to some authors, this race roams from Sept to Mar Apr, and some altitudinal movements also suggested. Vagrism recorded in Japan (W coast of N Honshu). Has been postulated that high-flying behaviour in winter and spring may be linked with eruptive movements by pairs. Post-fledging dispersal of young takes place soon after independence, when they leave natal site with others of species and



move to non-breeding range. No definite dispersal pattern noted during Taiwanese studies; even when juveniles moved to join a new flock, it was usually the one adjacent to parental flock.

**Status and Conservation.** Not globally threatened. Common and very widespread. Has adapted to a variety of semi-natural and man-modified habitats. Away from natural range, small feral populations appear to be establishing themselves in NW Italy, having been released from captivity by cagebird-traders: at Palude Brabbia Regional Nature Reserve and Ramsar Site, in Varese (Lombardia), this species occurs in mixed flocks with similarly introduced feral *P. alphonsianus*, although latter is much the commoner; also, at least two individuals were trapped during 1990s in Val Campotto-Vallesanta Nature Reserve, on Italian Adriatic coast.

**Bibliography.** Anon. (1984), Bakewell & Young (1989), Bangs & Peters (1928), Boto *et al.* (2000), Brazil (1991), Cai Qikan (1987), Caldwell & Caldwell (1931), Cheng Tsohsin *et al.* (1965), Clements (1989), Deditius (1897), Deignan (1964c), Delacour & Jabouille (1930), Dementiev *et al.* (1954, 1970), Flint *et al.* (1984), Fu Tongsheng *et al.* (1984), Hachisuka & Udagawa (1950, 1951), Han Lianxian (1991), Hartert (1907), Huang Qiang *et al.* (1995), Inskipp *et al.* (1996), Jirle & Kjellén (1987), Kazmierczak (1990), Kennerley (1987a, 1987b), Kim Chang-Hoe (1998), Kim Chang-Hoe *et al.* (1992, 1995a, 1995b), King (1987), King & Zheng Guangmei (1988), Kinnear (1929), Knyshtaus & Sihnev (1987), La Touche (1899, 1923, 1925-30), Laurie *et al.* (1986), Lee Jin-Won & Yoo Jeong-Chil (2004), Lee Woo-Shin *et al.* (2000), Lewthwaite (1996), McCarthy (2006), Meyer de Schauensee (1984), Nickel (1988), Park Eun-Mee *et al.* (1993), Pearce & Speight (1987), Poulsen (1984), Robson (1989b), Rothschild (1926), Schäfer & Meyer de Schauensee (1938), Severinghaus (1987, 1991, 1992), Stone (1933), Stresemann (1923c), Thayer & Bangs (1912), Tomek (2002), Traylor (1967), Vaurie (1959), Viney (1987), Vorobiev (1954), Wilder & Hubbard (1938), Williams *et al.* (1992), Won Pyong-Oh (1987), Wu Zhikang *et al.* (1986), Yang Xiuying (1991), Yu Zhiwei *et al.* (1986), Zhang Quntan *et al.* (1994), Zhao Xiubi (1994), Zhao Zhengjie (1985), Zheng Zuoxin & Qian Yanwen (1973), Zhu Xi & Fan Houde (1995).

## 11. Brown-winged Parrotbill

### *Paradoxornis brunneus*

French: Paradoxornis à ailes brunes

Spanish: Picoloro Alipardo

German: Braunflügel-Papageimeise

Other common names: Rickett's/Yunnan Parrotbill (*ricketti*)

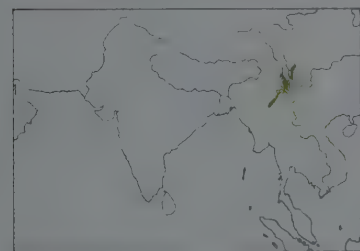
**Taxonomy.** *Suthora brunnea* J. Anderson, 1871, Momien [= Tengchong], western Yunnan, China. Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. alphonsianus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Considered conspecific with *P. webbianus* (and *P. alphonsianus*) by some authors, but widely accepted treatment as separate species supported by differences in skeletal features of skull. Race *ricketti* has sometimes been given full species rank, but there is currently no evidence of overlap in range with other races, as previously suggested by some authors; further study needed. Ranges of nominate and *styani* meet at S end of Dali Valley, at least; has been commented that latter is possibly the result of secondary intergradation, but series of museum specimens examined appeared very uniform in plumage characteristics, suggesting that it is a valid race. Three subspecies recognized.

#### Subspecies and Distribution.

*P. b. brunneus* (J. Anderson, 1871) – E (E part) & C (E part) Myanmar E to S China (W & NW Yunnan W of Lijiang Range and L Er Hai).

*P. b. styani* (Rippon, 1903) – Dali region, in NW Yunnan (S China).

*P. b. ricketti* Rothschild, 1922 – SW Sichuan (from Yalong Jiang) SW to NW Yunnan (to Lijiang Range and area E of L Er Hai), in S China.



**Descriptive notes.** c. 12–13 cm; male 8–13 g, female 6–10 g. Nominative race has bright chestnut crown to uppermost mantle and head side, contrasting with warm dark brown upperparts; upperside and tail similar to upperparts, remiges with pale outer fringing that is ashy to buffish on primaries (except two outermost); throat and upper breast vinous with darker chestnut streaks, well demarcated from pale belly, and rest of underparts buff-tinged (particularly in centre); iris brown, becoming red-brown in breeding season, orbital skin white; bill brownish-yellow to whitish-yellow, culmen blackish; legs greyish or grey-brown to pale olive. Distinguished from *P.*

*webbianus* mainly by brighter crown contrasting more with upperparts, plainer wings lacking chestnut, darker chestnut streaks on throat and breast, more buff-tinged below. Sexes alike. Juvenile differs from adult in having forehead to uppermost mantle duller and paler, appearing more concolorous with rest of upperside, which is darker and more rufescent, underside much buffier (particularly on belly and vent) and more uniform, with less obvious streaking. Race *ricketti* differs from nominate in darker chestnut crown to uppermost mantle, somewhat greyer upperparts (exact difference obscured by lack of fresh-plumaged specimens), pinkish-white throat and breast (streaks consequently very obvious and contrasting, also somewhat bolder), and paler remainder of underparts; *styani* is more or less intermediate between other two, but plumage below closer to previous. Voice. Keeps up a continuous twittering when feeding; no other information.

**Habitat.** Scrub and grass, thickets, sometimes in open forest or along forest edges; montane species, found at 1525–2375 m in Myanmar and 1830–2800 m in China.

**Food and Feeding.** Feeds on grass seeds; known to ingest some grit and sand. Outside breeding season occurs in pairs or fast-moving foraging parties, which may contain up to 35 or more individuals.

**Breeding.** Apr–Jun. Nest described as a rather deep, compact cup-shaped structure made from grasses, sometimes plastered with a little moss, lined with finer grasses, horsehair and similar, and situated up to 60 cm above ground in grass or rushes, brambles (*Rubus*) among grass, or a thick bush or tangle of creepers. Clutch 2–4 eggs (usually 3 in Myanmar), unmarked pale blue or fairly deep blue, with dimensions (in Myanmar) 15.2–17.5 × 12.7–13.5 mm. No other information available.

#### Movements.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Yunnan Mountains EBA. Generally uncommon to fairly common in suitable habitat throughout its very limited range.

**Bibliography.** Anon. (1980a), Bangs (1932), Deignan (1964c), Greenway (1933), Han Lianxian (1991), Harrington (1909, 1914a), Inskipp *et al.* (1996), McCarthy (2006), Meyer de Schauensee (1984), Riley (1926), Rippon (1903), Robson (1989c), Rothschild (1923, 1926), Smythies (1940), Stanford (1935), Stanford & Mayr (1940), Stanford & Ticehurst (1935, 1938), Stone (1933), Stuart Baker (1922), Tan Yaukuang & Cheng Tsohsin (1964), Traylor (1967), Vaurie (1959).

## 12. Ashy-throated Parrotbill

### *Paradoxornis alphonsianus*

French: Paradoxornis à gorge cendrée

German: Graukehl-Papageimeise

Spanish: Picoloro Gorgijrís

**Taxonomy.** *Suthora Alphonsiana* J. Verreaux, 1870, “les montagnes du Thibet chinois”; type from Chengdu, Sichuan, China.

Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Considered conspecific with *P. webbianus* and *P. brunneus* by some authors. Where range overlaps with that of former, the two species sometimes form mixed flocks in which occasional hybrids reported, e.g. in Vietnam (near Sa Pa, in W Tonkin), and hybrids seen also in NW Italy (where both species introduced); in China, interbreeding reported in 1938 in C Sichuan, and a number of earlier specimens from that region were considered to exhibit a range of features intermediate between the two species, but insufficient details available; has been suggested that race *ganluoensis* is one such intermediate form, but this highly unlikely, as its range is not in the overlap zone but closer to that of *P. brunneus*. Race *stresemanni* has sometimes been merged with nominate, but is much closer to, and possibly synonymous with, *yunnanensis*. Introduced birds of present species in Europe may represent an undescribed race; further study required. Four subspecies recognized.

#### Subspecies and Distribution.

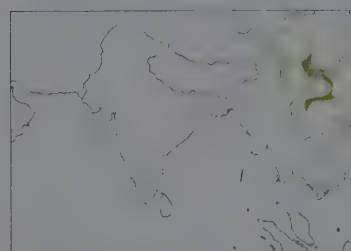
*P. a. alphonsianus* (J. Verreaux, 1870) – C & SC Sichuan, in C China.

*P. a. ganluoensis* Li Guiyuan & Zhang Qingmao, 1980 – Ganluo region of SC Sichuan (China).

*P. a. stresemanni* Yen Kwokying, 1934 – Guizhou and adjacent SE Sichuan, in SC China.

*P. a. yunnanensis* (La Touche, 1921) – extreme S China (SE Yunnan) and extreme N Vietnam (NW Tonkin).

Introduced in Europe (NW Italy).



**Descriptive notes.** 12.5–13 cm; 8–13 g. Nominative race has chestnut crown to nape sharply demarcated from cold dark brown upperparts; upperside and tail dark brown, flight-feathers and tertials fringed dark chestnut; lores to head side, neck side and breast quite dark brownish-grey, throat greyer still, with rather narrow dark streaks, flanks cold dark grey, centre of abdomen duller; iris pale grey or bluish-grey to brown; bill dusky flesh-coloured; legs flesh-coloured. Differs from *P. webbianus* mainly in more sharply defined chestnut crown to nape, darker upperparts, darker chestnut fringing on wings including outer tertial fringes, lack of

any obvious vinous-pinkish on head side, throat and breast, which are much greyer. Sexes alike. Juvenile is more uniformly chestnut-tinged above than adult, has somewhat paler and browner head side and paler, more uniform and buffier underparts. Race *yunnanensis* is somewhat brighter than nominate on crown, nape and wing fringing, has upperparts warmer-tinged, side of head/neck purer grey (contrary to some published statements, head side not dull greyish-vinous nor dull greyish with vinous wash), base colour of throat and upper breast paler or whiter, remainder of underparts paler; *stresemanni* shows no obvious differences from previous; *ganluoensis* is said to differ from nominate in having cheeks and ear-coverts “chestnut-red”. Voice. Sings with loud, high-pitched series of 3–4 notes (usually 4 notes), delivered with varying rapidity, e.g. “tsu-tsu-tsu-tsu” or “tsse-tsse-tsse-tsse”, or “tsu tsu-tsu-tsu” (with uneven note spacing), also a longer series of “tsu” when excited (in response to tape playback); also “tsu-tsu-tsu-tsu-tsu-tsu”, with final note weaker. Calls include rather harsh, chuntering, sometimes scolding series, e.g. “twer-twer-twer-twer”, “twi-twi-twi”, “trr-ttr-ttr”, “tcher-der-der”, “chip-ip-ip-ip” and similar; contact calls very light “tu”, “twi”, “ti” and “du” notes, often rapidly combined; low purring “prrrr-ee” and “prrrr-ee” heard at close range.

**Habitat.** Scrub, grass, thickets, tea plantations, forest edge. Recorded at 1100–1500 m in Vietnam; 320–2350 m, locally as high as 2570 m, in China. Introduced population in Italy inhabits beds of common reed (*Phragmites australis*) and areas dominated by meadowweet (*Filipendula ulmaria*), early goldenrod (*Solidago gigantea*) and grey willow (*Salix cinerea*); apparently no documentation of the species’ occurrence in marshland in its native range.

**Food and Feeding.** Seeds. Except when breeding, found in fast-moving parties of 10–40 or more individuals; sometimes associates with *P. webbianus* in Vietnam. Introduced Italian population feeds on seeds, buds and insects, the last-mentioned being main food for young; during winter months, feeds on insects found on inside of common reed stems.

**Breeding.** Apr–Aug in China. Nest a cup-shaped structure made of bamboo or other leaves, grass, bits of fern, moss, cobwebs, bark, ears of wheat and the like, lined with fine grasses, palm fibre, wool, pigs’ hair and similar, external diameter 6–10.9 cm, height 6.5–9.2 cm, internal diameter 4–6.5 cm, depth 3.5–5.6 cm; placed in branch fork in small tree or bush, or in a clump of bamboo or grass, usually 0.5–1.5 m above ground. Clutch 2–6 eggs, usually 3–5, those of race *stresemanni* described as plain white, bluish-white, greenish-white or pale blue, 14.9–19 × 12–13 mm. No other information.

**Movements.** Sedentary. Although the feral numbers of the species have built up very quickly in NW Italy, the species is considered to be very slow in expanding its overall range there.

**Status and Conservation.** Not globally threatened. Considered to be fairly common throughout its rather restricted natural range in China and N Vietnam. In Europe, this species has recently become naturalized in NW Italy, at Palude Brabbia Regional Nature Reserve and Ramsar Site, in Varese (Lombardia), where it occurs in mixed flocks with similarly introduced feral *P. webbianus*, and is much the commoner of the two; population at Brabbia has risen from an estimated 24 individuals in 1995 to several hundreds ten years later; evidence also of range expansion there, with observations at two localities in nearby Lago di Varese area in Dec 1998. The naturalized Italian population could potentially pose a threat, through competition for food etc., to some scarce native species.

**Bibliography.** Anon. (2004c), Bangs (1932), Bangs & Van Tyne (1931), Boto *et al.* (2000), Cheng Tsohsin & Cheng Paolai (1960), Cheng Tsohsin, Tan Yaukuang & Li Yungshin (1965), Cheng Tsohsin, Tan Yaukuang, Liang Chunyu & Chang Chunfan (1963), Deignan (1964c), Dowell *et al.* (1997), Hartert (1907), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskipp *et al.* (1996), Kazmierczak (1990), King (1989b), La Touche (1923), Li Guiyuan & Zhang Qingmao (1980), Li Guiyuan, Liu Liangcai *et al.* (1976), Li Guiyuan, Zhang Qingmao, Luo Jiazai *et al.* (1994), Li Guiyuan, Zhang Qingmao & Wen Anxiang (1993), Liu Kezhi *et al.* (1994), McCarthy (2006), Meyer de Schauensee (1984), Robson (2000), Rothschild (1926), Schäfer & Meyer de Schauensee (1938), Stett (1993), Stresemann (1923c), Thayer & Bangs (1912), Traylor (1967), Uchida & Kuroda (1916), Wu Zhikang *et al.* (1986), Yen Kwokying (1934b), Zhang Quntan *et al.* (1994), Zheng Zuoxin *et al.* (1987).



## 13. Grey-hooded Parrotbill

*Paradoxornis zappeyi*

French: Paradoxornis de Zappey Spanish: Pícoloro Encapuchado  
German: Grauhauben-Papageimeise  
Other common names: Crested/Dusky/Zappey's Parrotbill, Dusky Crowtit

**Taxonomy.** *Suthora zappeyi* Thayer and Bangs, 1912, Wa-shan, near Hanyuan, Sichuan, China. Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. alphonstanus*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Two subspecies recognized.

**Subspecies and Distribution.**

*P. z. zappeyi* (Thayer & Bangs, 1912) – SC Sichuan (excluding Erlang Shan) and NW Guizhou, in SC China.

*P. z. erlangshanicus* Cheng Tsohsin *et al.*, 1983 – Erlang Shan, in SC Sichuan (China).



**Descriptive notes.** 12–5 cm; male 10 g, female 9 g. Distinctive parrotbill, with bushy crest reaching its peak above the eye. Nominative race has forehead to uppermost mantle mid-grey ("mouse-grey"), darkening somewhat towards forehead, which is also faintly streaked; lores to above eye dark grey to blackish, offsetting white eyering which is obscured with grey mark above/in front of eye and split by a thin dark line at front and rear; upperparts, including upperwing-coverts, slightly rufescent mid-brown, becoming somewhat paler or duller (perhaps buffier) on rump and uppertail-coverts; flight-feathers dark greyish to dark

brownish, with outer fringes similar in colour to upperparts; tail dark greyish to dark brownish-grey, outer fringes of feathers a duller version of upperpart colour; head side paler grey than hindcrown, merging into more ashy or whitish colour with buff tinge on throat and centre of upper breast, where shows faint greyish streaking; flanks and undertail-coverts warm buff, belly centre more pale greyish; iris dark; bill pale yellowish, basal half of upper mandible pinkish-grey to pale pinkish-horn; legs dark greyish to dark pinkish-grey or brownish-grey. Sexes alike. Juvenile undescribed. Race *erlangshanicus* is said to differ from nominate in having paler grey forehead to uppermost mantle, with less distinct darker shaft stripes, duller rufescent-brown upperparts and wing-feather fringes, paler and less brownish-tinged fulvous rump and uppertail-coverts, much paler grey sides of head and neck, and much paler sides of abdomen and undertail-coverts. Voice. Song a thin, high, piercing "ss-s-s-si". Only calls recorded are harsh, abrupt, scolding, rather rasping "trr'ik" and "trrrh" notes.

**Habitat.** Bamboo and bushes, including rhododendron (*Rhododendron*), in open mountain-top conifer forest, including fir (*Abies*) forest, and mixed fir–rhododendron forest; recorded only at 2350–3437 m, with one report from c. 1000 m (Wannan, on Emei Shan). Apparently restricted to open forest and scrub patches on exposed peaks and ridges near mountain tops.

**Food and Feeding.** Insects, including beetles (Coleoptera), and their pupae, also seeds; bamboo seeds may be important in diet. Found in small parties of up to ten individuals, foraging through low vegetation.

**Breeding.** May–Jun. Nest a relatively large, untidy, very deep cup-shaped structure made mainly of moss, lined with fine grasses, fine roots, and shreds of dead bamboo leaves, estimated external height 10–12 cm, internal diameter 6 cm and depth 8 cm; one was 50 cm above ground and woven around dead bamboo stems. Clutch 2–4 eggs, sky-blue in colour, reminiscent of those of Dunnock (*Prunella modularis*), estimated egg dimensions in one nest c. 15 × 10 mm. No other information.

**Movements.** May undertake minor altitudinal movements coinciding with hard weather or bamboo die-off.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Central Sichuan Mountains EBA. Locally common. Has so far been recorded from only nine places. Although considered to have a declining and severely fragmented population, there is currently no hard evidence to support this. In survey at Wawu Shan (Wa Shan) in 2003, 18 pairs found in area of 60 ha; on Emei Shan, described as not uncommon to common during period 1985–1998. Although status information rather lacking, these and other records indicate that this species can exist at fairly high densities in suitable habitat; its highly localized distribution and small number of localities, however, suggest that it could have a small total population. Main threat considered likely to be the loss and further fragmentation of its habitat, which is already naturally localized and fragmented. Substantial areas of forest have been lost within its overall range, but unclear whether the general reduction in forest cover has affected this high-altitude species. On Emei Shan, the limited area of open forest and scrub inhabited by this species was partially cleared in 1998 for construction of a tourist railway, and, once this is completed, increased number of tourists visiting the summit could negatively affect its habitat; possible also that periodic flowering and die-off of bamboo, in combination with habitat fragmentation, may affect its total population. Has been recorded from Emei Shan Protected Scenic Area, Mabian Dafengding Nature Reserve and Meigu Dafengding Nature Reserve, in Sichuan; may well occur also in Caohai Nature Reserve, in Guizhou, but it is apparently unclear whether suitable habitat exists within the reserve boundaries.

**Bibliography.** Anon. (2003c, 2006d), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Cheng Tsohsin, Li Jianxun & Zhang Ungmao (1983), Cheng Tsohsin, Tan Yookang *et al.* (1983), Collar *et al.* (2001), Deignan (1964c), Inskipp *et al.* (1996), King (1989c), Meyer de Schauensee (1984), Stattersfield & Capper (2000), Thayer & Bangs (1912), Wu Zhikang *et al.* (1986), Zheng Guangmei & Wang Qishan (1998).

## 14. Rusty-throated Parrotbill

*Paradoxornis przewalskii*

French: Paradoxornis de Przewalski Spanish: Pícoloro de Przewalski  
German: Przewalskipapageimeise  
Other common names: Grey-crowned/Przewalski's Parrotbill, Grey-crowned Crowtit

**Taxonomy.** *Suthora przewalskii* Berezowski and Bianchi, 1891, Hsiku and Minchow districts [presumably = Zhuguo and Min Xian Counties], southern Gansu, China.

Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. alphonstanus*, *P. zappeyi*, *P. fulvifrons*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Monotypic.

**Distribution.** S Gansu and extreme N Sichuan, in C China.



**Descriptive notes.** 13–14.5 cm. Highly distinctive parrotbill, with long and strongly graduated tail and some unique plumage characters. Has crown to uppermost mantle ash-grey, merging on lower mantle into olive-brown colour of upperparts, brighter on scapulars and rump; nasal feathers, lores and forehead chestnut-black, continuing in long supercilium which is narrower and brighter over eye and becomes somewhat broader and blacker towards nape side; upperwing dull-coloured with olive tinge, inner webs of median upperwing-coverts blackish, inner webs of tertials olive-tinged blackish-brown, inner webs of remiges

greyish-black, outer webs of remiges dull-coloured but tinged bright chestnut on basal part of primaries; all tertials and flight-feathers (except outermost primaries) have dull pale outer fringe (only at base and central part of primaries), this continuing around to inner fringe on tertials and secondaries; tail olive-grey with warmer/brighter outer fringing; throat and upper breast chestnut, this colour extending through malar area to cheek and upper ear-coverts behind eye, with breast centre somewhat brighter, rear ear-coverts and neck side and breast side grey with warm brown tinge, flanks and belly to undertail-coverts dull greyish-buffish but brighter on lower parts; underwing-coverts pale-coloured, axillaries greyish-white; iris brick-red; bill pinkish or rose-coloured, upper mandible with white tip, lower mandible with yellowish tinge; legs bluish-grey. Sexes alike. Juvenile essentially undescribed, apart from yellow-ochre iris of young male. Voice. Calls include rather harsh, spluttering, rolling "chrr-r-r-r-r" and "chrr-r-r-r-r-r-r", sharp, abrupt, quite shrill "tsip", "chit" or "chip" notes, also "tsit-it", "chip-ew" or "chit-er", and "chip chit-r-r-r"; also, an occasional weak, thin, short, questioning "tser" or "hsew".

**Habitat.** Bamboo and "tussocks" in open larch (*Larix*) and other coniferous forest, including fir (*Abies*) and spruce (*Picea*); documented altitudinal range limits 2440–3050 m.

**Food and Feeding.** Reported as feeding mainly on insects. Typically, travels in pairs, family parties or, outside breeding season, small hyperactive flocks of up to 15 individuals; a flock of at least eight birds observed in late May consisted mostly of paired individuals.

**Breeding.** Juvenile in Aug described as "not fully feathered", suggesting season Jul–Aug. No other information.

**Movements.** No documented movements, but strong anecdotal evidence suggests that it may be forced to move locally in response to flowering and die-off of bamboo.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in Central Sichuan Mountains EBA. Exceptionally poorly known species; virtually no information available on population. Although was considered to have a small, declining and severely fragmented population, there is no real evidence to support any of these assessments, but no doubt has a naturally small range. Known from only four areas in the Min Shan of S Gansu and N Sichuan; only recent records are from Jiuzhaigou Nature Reserve, and none since 1995, and has not been seen regularly since a mass flowering and die-off of bamboo there in late 1980s. Has been said that major threat to this species' continued survival is loss of habitat through logging and conversion to agriculture, but no evidence that logging would adversely affect it, particularly if it is dependent on bamboo; conversion of land to agriculture, however, would obviously have deleterious impact. Range overlaps with N part of distribution of giant panda (*Ailuropoda melanoleuca*), which is protected in a number of nature reserves; distribution and abundance of this parrotbill within these reserves is poorly known, however, and it is currently recorded from only one protected area, Jiuzhaigou Nature Reserve (200 km<sup>2</sup>).

**Bibliography.** Anon. (2006d), Berezowski & Bianchi (1891), Butchart & Stattersfield (2004), Cheng Tsohsin (1987), Collar *et al.* (2001), Deditis (1897), Deignan (1964c), Dresser & Delmar-Morgan (1899), Hartel (1907), Inskipp *et al.* (1996), Meyer de Schauensee (1984), Stattersfield & Capper (2000), Vermeulen (1995).

## 15. Fulvous Parrotbill

*Paradoxornis fulvifrons*

French: Paradoxornis à front fauve Spanish: Pícoloro Leonado  
German: Gelbstirn-Papageimeise  
Other common names: Fulvous-fronted Parrotbill/Suthora/Crowtit

**Taxonomy.** [*temnoris*]. *fulvifrons* Hodgson, 1845, Nepal.

Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. alphonstanus*, *P. zappeyi*, *P. przewalskii*, *P. nipalensis*, *P. verreauxi* and *P. atrosuperciliaris* in a separate genus, *Suthora*. Birds reported from W Arunachal Pradesh, in NE India, included in nominate, but may belong with race *chayulensis*. Four subspecies recognized.

**Subspecies and Distribution.**

*P. f. fulvifrons* (Hodgson, 1845) – C Nepal E to Bhutan and NE India (W Arunachal Pradesh).

*P. f. chayulensis* (Kinnear, 1940) – NE India (NC Arunachal Pradesh) and adjacent S China (SE Xizang).

*P. f. albifacies* (Mayr & Birkhead, 1937) – E part of N Myanmar and adjacent S China (SW Sichuan S to extreme SE Xizang and W & NW Yunnan).

*P. f. cyanophrys* (David, 1874) – C China (SW Shaanxi S to SC Sichuan).



**Descriptive notes.** 12–12.5 cm; female 7 g (*chayulensis*). Nominative race has whitish-buff forehead, rich buff forehead fading to hindcrown, dark greyish-olive lateral crown-stripe (starting more narrowly above eye, very broad on rear crown side and fading onto nape side), and rich buff eyering and narrow supercilium (from eye); nape and upperparts warm buffish-grey with olive tinge, rump and undertail-coverts more rich buffish, upperwing-coverts similar to mantle, but outwardly edged rufous on greater and primary coverts and darker on inner webs; flight-feathers and tertials grey-black (first tertial similar to mantle)

but with white inner edges which decrease in extent from innermost primaries outwards (and are rich buff on tertials), primary P10 with narrow whitish outer fringe at base, P9 with narrow whitish edge extending almost to tip (rich buff at base), P8–P6 with more prominent edge, rich buff basally and white terminally, P5 similar but with narrow fringe, P4 similar but with very narrow fringe



**Movements.** Largely sedentary; some minor local altitudinal movements brought on by cold weather.

**Status and Conservation.** Not globally threatened. Common to locally common, and widespread. Generally commoner in Himalayan part of its range than it is farther E.



**Bibliography.** Abdulali (1983), Ali & Ripley (1996), Ali *et al.* (1996), Anon. (1980a), Choudhury (2001), Deignan (1963, 1964b), Delacour & Jabouille (1931b), Evans & Timmins (1998), Fleming & Traylor (1964), Godwin-Austen (1876a, 1876b), Hartert (1907), Hopwood & Mackenzie (1917), Inskipp, C. & Inskipp (1991, 1993b, 1996), Inskipp, C. *et al.* (2000), Inskipp, T.P. (1991), Inskipp, T.P. *et al.* (1996), Katti *et al.* (1992), King, Buck *et al.* (2001), King, Dickinson & Woodcock (1975), Koelz (1954), Lekagul & Round (1991), Ludlow & Kinscar (1937, 1944), McCarthy (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1952, 1982), Robertson, A. (1999), Robson (1997), Rothschild (1926), Singh (1995), Smith *et al.* (1943), Smythies (1940, 1949), Spierenburg (2005), Stanford (1941), Stanford & Mayr (1940), Stanford & Ticehurst (1935, 1938), Stevens (1923), Stresemann & Heinrich (1940a), Stuart Baker (1922), Thompson & Craddock (1902), Wickham (1929).

## 17. Golden Parrotbill

### *Paradoxornis verreauxi*

**French:** Paradoxornis de Verreaux

**German:** Goldstirn-Papageimeise

**Spanish:** Picoloro Dorado

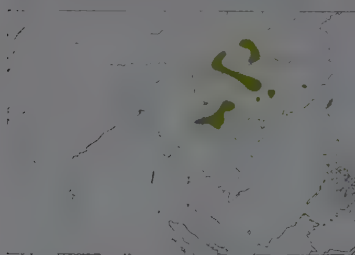
**Other common names:** Blyth's Parrotbill

**Taxonomy.** *Suthora verreauxi* Sharpe, 1883, "le Thibet oriental"; type specimen from Baoxing, Sichuan, China.

Initially described by J. Verreaux as *Suthora gularis*, but that name invalid, as preoccupied. Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. alphonisianus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis* and *P. atrosuperciliaris* in a separate genus, *Suthora*. It has in the past been considered conspecific with *P. nipalensis*, but is very distinct morphologically; race *craddocki* has erroneously been listed for that species by some authors. In China, birds from Ailao Shan (C Yunnan) of uncertain racial identity, currently included within *craddocki*; specimens from Guizhou have sometimes been assigned to race *pallidus*, but this seems unlikely from a geographical point of view. Four subspecies recognized.

#### **Subspecies and Distribution.**

*P. v. verreauxi* (Sharpe, 1883) – C China (NC to SC Sichuan, and SE Shaanxi S to SW Hubei).  
*P. v. craddocki* (Bingham, 1903) – extreme E Myanmar (E of R Salween) E to N Laos and extreme N Vietnam (W Tonkin, NW part of E Tonkin), and S China disjunctly in C Yunnan (Ailao Shan), E Guangxi (Yao Shan), S Hunan and N Guangdong.  
*P. v. pallidus* (La Touche, 1922) – N Fujian, in E China.  
*P. v. morrisonianus* (Ogilvie-Grant, 1906) – Taiwan.



**Descriptive notes.** 11.5 cm; 5–7 g. Nominate race has rich rufous-brown crown and nape, area round eye heavily marked black on whitish ground, loreal area greyish, cheek and moustachial and malar areas whitish, ear-coverts orange-buff; upperparts warm chestnut-ochre; upperwing-coverts, including primary coverts, similar in colour to upperparts; flight-feathers and tertials blackish, broadly edged white on inside, becoming rich buff on tertials, outer edges of secondaries rufous and narrowly tipped white, primaries with white outer fringe (varying in extent), inner primaries with narrow pale olive outer fringe, fringing at base of

inner primaries and secondaries golden-rufous; tail graduated, warm chestnut on upperside, brighter and richer basally, dusker distally, with bright chestnut fringing on outer rectrices; centre of throat black, bordered greyish below, underparts white centrally, with broad warm chestnut-ochre flanks; iris dark brown to red; bill plumbeous, lighter on lower mandible, or grey-pink to pinkish; legs flesh-coloured with plumbeous tinge. Sexes alike. Juvenile undescribed. Race *craddocki* has rich rufescent-brown or golden-brown crown and nape, paler on forehead, upperparts somewhat paler and more olive-tinged, paler still and more rufescent on rump and uppertail-coverts, narrow white supercilium (to just behind eye); *pallidus* differs from nominate in having paler and less rufous crown and nape, which are perhaps a little more buffish-olive or golden-olive, more rufous-buff forehead, slightly paler and more buff postocular supercilium and ear-coverts, and buffier flanks; *morrisonianus* is similar to last, but hindcrown to back, scapulars and upperwing-coverts duller and distinctly more olive-greyish, supercilium longer behind eye and greyer in front of it and on lores, broadly sooty-blackish below eye, ear-coverts mixed with greyish-white, throat all black, upper flanks with distinctly more olive-greyish wash. Voice. Song of nominate race "chúúr-díí", shorter and weaker than that of *P. nipalensis*; also utters thin high-pitched, wispy "hsu-suu-suu-si", which could represent a second type of song. Typical calls of nominate and *craddocki* are quite harsh, low, slightly spluttering, e.g. "trr-it" or "trr-ee", "trrit", "trr-r-r" and "trr-r-r", strongly reminiscent of certain calls of Golden-breasted Fulvetta (*Leiparus chrysotis*); foraging flocks of these two races also utter jumble of high "it", "twit", "tit" and "tip" notes; nominate also gives thin, high, rather hoarse, breathless "tssuu" and "tssuu-tir".

**Habitat.** Bamboo, edge of broadleaf evergreen forest; *Arundinaria* bamboo in hemlock (*Fagopyr*) forest. Found at 1500–3000 m in SE Asia; in China at 1000–2200 m, locally down to 330 m in winter; at 2000–3050 m in Taiwan.

**Food and Feeding.** Feeds on tiny larvae, small beetles (Coleoptera), and seeds. Found in pairs or in small parties of up to ten individuals, often associates with babblers (Timaliidae), including *Imantodes*, in mixed feeding flocks.

**Breeding.** Following details apply to Taiwan race *morrisonianus*. Breeds in Jul. Nest built by both sexes, reported as a funnel-shaped structure, entrance hole at one side of top, constructed mostly of green moss, lined with fine fibres, external dimensions 15 × 9 cm, entrance diameter 2.7 cm; internal depth from entrance 4.5 cm; situated 1.5 m above ground in *Arundinaria* bamboo. Clutch of 3 unglazed pale milky-blue eggs, dimensions 15–16 × 11.8–12 mm; both sexes incubate. No further information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Widespread, and generally not uncommon in suitable habitat, throughout its range. Locally common in China; uncommon to locally common within its small area of distribution in SE Asia.

**Bibliography.** Anon. (2002b, 2003b), Bingham (1903), Bourret (1943), Cheng Tsohsin, Tan Yaokuang & Li Yunghsin (1965), Cheng Tsohsin, Tan Yaokuang, Liang Chunyu & Chang Chunfan (1963), Davidson (1998), Deignan (1964c), Delacour & Jabouille (1931b), Deng Xuejian *et al.* (1995), Dowell *et al.* (1997), Hachisuka & Udagawa (1950, 1951), Huang Qiang, Deng Heli & Mao Ke (1995), Huang Qiang, Huang Yongzhao & Deng Heli (1993), Inskipp *et al.* (1996), Kennerley (1987a), King (1989b, 1989c), Laurie *et al.* (1986), La Touche (1899, 1922, 1925–30), Le Manh Hung *et al.* (2002), Lewthwaite (1996), Li Guiyuan, Liu Liangzei *et al.* (1976), Li Guiyuan, Zhang Qingmao *et al.* (1994), Liu Kezheng *et al.* (1994), Meyer de Schauensee (1984), Ogilvie-Grant (1906), Paulsen (1984), Smythies (1940), Tizard *et al.* (1997), Tordoff, Lê Manh Hung *et al.* (2002), Tordoff, Lê Trông Dat & Hardcastle (2001),

Wang Zhijun & Chen Huojie (1983), Wu Zhikang *et al.* (1986), Yang Xiuqing (1991), Yen Kwokying (1934b), Zhang Quntan *et al.* (1994), Zheng Xuoxin & Qian Yanwen (1973).

## 18. Short-tailed Parrotbill

### *Paradoxornis davidianus*

**French:** Paradoxornis de David

**German:** Kurzschwanz-Papageimeise

**Spanish:** Picoloro de David

**Other common names:** David's Parrotbill/Crowtit

**Taxonomy.** *Suthora davidiana* Slater, 1897, Guadun, north Fujian, China.

Sometimes placed in a separate genus, *Neosuthora*. Racial identity of birds in extreme N Laos and extreme NW part of W Tonkin (N Vietnam) uncertain, but they are presumed to belong with *thompsoni*; likewise, birds in N (extreme E part) & C (NE part) Laos and neighbouring Vietnam (N Annam) are presumed to belong with *tonkinensis*. Individuals of this species found in S Hunan and N Guangdong (SE China) are of unspecified race; further study required. Three subspecies currently recognized.

#### **Subspecies and Distribution.**

*P. d. thompsoni* (Bingham, 1903) – S part of E Myanmar, NW & extreme N Laos, extreme NW Vietnam (extreme NW Tonkin) and SE part of NW & adjacent NE Thailand.

*P. d. tonkinensis* (Delacour, 1927) – NE & NC Laos and adjacent NC Vietnam (N Annam and E Tonkin).

*P. d. davidianus* (Slater, 1897) – S Zhejiang and N Fujian, in E China.



**Descriptive notes.** 9.5–10 cm; 8.5 g (S Hunan, in China). A tiny short-tailed parrotbill with jizz like that of a munia (*Lonchura*), and with very deep-based pale bill. Nominative race has blackish-brown lores and area above eye, dull rufous or rufous-chestnut rest of head and upper mantle (somewhat browner on hindcrown to upper mantle), mid-grey lower mantle and scapulars to rump with buffish-brown wash, rufous uppertail-coverts; upperwing-coverts and tertials similar to lower mantle and scapulars; primaries and secondaries dark greyish-brown, primaries outwardly edged pale buffish (duller and more olive at base), then

warmer and paler, then paler still and less warm towards feather tip, outer fringes of secondaries warm buffish (darker and more olive at base), inner webs of primaries and secondaries edged buff (on primaries decreasing towards base from inner to outer feathers); uppertail medium to dark brown, with dull rufous to rufous-chestnut outer fringes (broader at base of feathers), inner edges narrowly paler, dull buffish-brown; centre of throat black, with narrow rufous-buff tips on upper throat and broader greyish-white (buff-tinged) tips on lower throat (giving mottled or streaked appearance); upper breast greyish-white with buffish wash, grading to greyish-buff on flanks, rich buff lower flanks and vent, more greyish-white abdomen centre; iris crimson to brown or hazel; bill flesh-coloured, with culmen ridge white (or white with lilac at base), to bluish-white overall (turns yellowish to orange on dead specimens); legs purplish-brown or plumbeous-grey to dull reddish-grey or flesh-grey. Sexes alike. Juvenile undescribed, probably resembles adult. Race *thompsoni* has deeper chestnut crown to upper mantle and head side than nominate, upperparts rather dark ashy grey, throat centre all black, legs sometimes fleshy-yellow in colour; *tonkinensis* is similar to previous but with throat like that of nominate, is purer grey below, and possibly paler grey above. Voice. Song a very thin, high-pitched, rapid ascending series of 6–9 notes, "ih'ih'ih'ih'ih'ih'ih' or "zu'zu'zu'zu'zu'zu'.."; also "tit tit tit tit tit tit tit tit tit tit" (soft spaced notes, then rising "hiuuu", followed by short ditty). Foraging flocks utter soft "tip", "tit" and "tut" contact notes, which can mix together to sound like low twittering; also, occasional thin "tssu" or "chu"; harder shrill stressed "si'si'si'si'si't..", and rather harsh "tidit t'di'di'dit" are probably alarm calls.

**Habitat.** Bamboo, grass, edge of broadleaf evergreen forest. Found at 50–1200 m in SE Asia; 110–1250 m in China, but apparently locally up to 1830 m in Fujian (recent sightings in Fujian are below 1250 m).

**Food and Feeding.** Feeds on small larvae and vegetable matter. Found in fast-moving hyperactive flocks, sometimes quite large outside breeding season; often in mixed bird waves with other small species, including Grey-cheeked Fulvetta (*Alcippe morrisonia*) and *Stachyris* and *Stachyridopsis* babblers. Feeds at various levels in bamboo, from low down to 3–4 m above ground; occasionally ascends into trees.

**Breeding.** Mar–Apr in Vietnam. Nest a cup-shaped structure made of green moss, grasses, cobwebs, and slender bamboo leaves etc., lined with fibres and pliable grasses, placed a metre or so above ground in dwarf bamboo. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Local status varies considerably, presumably depending on precise suitability of habitat. Locally common at certain Vietnamese and Chinese sites, but very scarce and difficult to locate at others.

**Bibliography.** Anon. (2004a), Bingham (1903), Caldwell & Caldwell (1931), Deignan (1963, 1964b), Delacour (1927), Delacour & Jabouille (1931b), Huang Gan (2003), Inskipp *et al.* (1996), King *et al.* (1975), La Touche (1899, 1925–30), Lekagul & Round (1991), Lewthwaite (1996), MacKinnon & Vu Van Dung (1992), Meyer de Schauensee (1934, 1984), Nguyễn Đức Tu *et al.* (2001), Poole (1996), Showler, Davidson, Khounmee Salivong & Khankhoun Khounholine (1998), Smythies (1940), Stuart Baker (1922), Timmins & Trinh Viet Cuong (1999), Tizard *et al.* (1997).

## 19. Lesser Rufous-headed Parrotbill

### *Paradoxornis atrosuperciliaris*

**French:** Paradoxornis à sourcils noirs

**German:** Schwarzbrauen-Papageimeise

**Spanish:** Picoloro Cejinegro

**Other common names:** Black-browed Parrotbill/Crowtit, Lesser Red-headed Parrotbill/Suthora

**Taxonomy.** *Chalcus atrosuperciliaris* Godwin-Austen, 1877, Sadiya, Assam, north-east India.

Sometimes placed together with *P. conspicillatus*, *P. webbianus*, *P. brunneus*, *P. alphonisianus*, *P. zappeyi*, *P. przewalskii*, *P. fulvifrons*, *P. nipalensis* and *P. verreauxi* in a separate genus, *Suthora*. Racial identity of birds in W Arunachal Pradesh (W of R Dihang), in NE India, uncertain, presumed to belong with *oatesi*. Two subspecies recognized.



**Descriptive notes.** c. 18–20 cm; in late winter/spring average of ten males 23.48 g and four females 18.25 g, in *M. m. minor* in late summer male 17.7–19.4 g and female 15.9–17 g. The only parrotbill that exhibits seasonal differences in plumage. Nominate race non-breeding (fresh plumage, winter) has forehead and crown centre to nape broadly streaked with pinkish-cream and ash-grey, broad lateral crown streak from above eye to nape side (broadest on rear crown side) streaked black and rather warm brown; lores similar to forehead but mixed a little whiter, white eyering (broken at front by dark brown), whitish cheek



[illegible]

**Habitat.** Lowland reedbeds; to c. 800 m in Mongolia. Nominate race is found in reedbeds of riverbanks, islands and estuaries, as well as other coastal reedbeds; in Fengxian County, in Shang-

hai (E China), population density in short reedbeds (1.4–2.5 m in height) was greater than that in tall reedbeds (2.6–3.5 m in height); short, (tideland) reedbeds were found to hold highest densities, followed by short dried-out beds. In Mongolia, race *polivanovi* occurs mainly in reeds bordering freshwater lakes; in one study, all broods and solitary pairs were found on the edge of, or near, extremely dense reeds up to 3 m tall growing in patches among the general mass of relatively low-growing reeds, and nests were apparently built in such places. Shares habitat with *Pomurus biarmicus* in Mongolia (where latter considered to be rarer), and with *P. webbianus* where ranges overlap in China.

**Food and Feeding.** Feeds on insects, including certain pancake-shaped "scale insects" (Acleridae) which infest reeds; also takes insects' eggs and larvae, including those of grasshoppers and crickets (Orthoptera). This species' lack of a gizzard muscle prohibits the digestion of hard food items. Makes loud sounds when tearing open reed stems to obtain food, and works on entrance holes made by insects in reeds after inserting the point of its bill; also cuts through stems with the bill or strips away pieces to obtain prey items. Apparently, lower mandible can be extended forwards (in relation to upper mandible) by one third of its own length, presumably a feeding adaptation. Travels through reedbeds in flocks of 5–15, sometimes up to 30 or even 50 or more individuals, but is typically found in pairs during breeding season.

**Breeding.** May–Aug, sometimes multi-brooded. Nest, built in 6–7 days, a beautiful cup-shaped structure made of strips of dead reed sheaths, and bound, rimmed and lined mainly with filaments of tough dead reed stems, occasionally with some cobwebs mixed in, external diameter 8–8.2 cm, height 9.5–10 cm, internal diameter 5–5.1 cm, depth 5.7–6.5 cm; situated 1.3–1.7 m above ground among reeds and supported in mid-air by two stems, in fashion similar to that of Eurasian Reed Warbler (*Acrocephalus scirpaceus*). Clutch 2–5 eggs, medium-glossed greenish-white with large blotches and clouds of pale sienna (with centres darker) over underlying blotches and spots of pale inkly-purple, or cream-coloured with brown spots (densest and forming ring at broader end), those of nominate race 18–18.8 × 14.2–14.5 mm, average of four eggs of *polivanovi* (from L Khanka) 16.9 × 12.9 mm; incubation by both sexes, period c. 12 days; both also feed young, no information on duration of nestling period.

### Movements, Sedentary

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Locally common, but totally dependent on reedbeds. In E China, population in coastal Fengxian County (Shanghai) in 1988 estimated to be 290–387 individuals, based on density of 1·21 pairs/ha; population density in short reedbeds up to 3·13 pairs/ha, compared with up to 0·74 pairs/ha in tall reedbeds. At L Khanka, in SE Russia, population estimated at 600–700 individuals in 1987, and 350–400 wintering birds and 230 nesting pairs reported there in 1999. Currently known to occur in a good number of protected areas, in China, Mongolia and Russia. Main threats to the species are obviously associated with clearance of reedbeds; over-harvesting of reeds (rather than a wildlife-sympathetic rotational method) also poses a serious threat to some populations. In Fengxian County (Shanghai), there has apparently been large-scale destruction of reedbeds for paper pulp and reclamation of tidal lands for cultivation.

**Bibliography.** Anon. (2006a), Bakewell & Young (1989), Brazil (1992), Butchart & Stattersfield (2004), Collar *et al.* (2001), Deignan (1964c), Flint *et al.* (1984), Fomin *et al.* (1979), Inskip *et al.* (1996), Jenson (1987), Knyatstas & Sibnev (1987), La Touche (1925-30), Lyne (1941), Ma Shiquan (1988), Meyer de Schauensee (1984), Neufeld & Wunderlich (1982), Newell (1999), Poole (1994), Rank (1989), Robson (1988, 2002), Scott (1989), Shirevdamba *et al.* (1997), Stattersfield & Capper (2000), Stepanyan (1974, 1979, 1998, 2003), Sytan (1891), Zheng Guangmei & Wang Dishan (1998).





Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family POMATOSTOMIDAE**  
**(AUSTRALASIAN BABBLERS)**



- Medium-sized, terrestrial passerines with rather elongated body, short, broad and rounded wings, long graduated tail with rounded tip, longish decurved bill, strong legs and feet; plumage rather sombre, typically brown, russet and grey, most species with distinct pale supercilium, one species mostly rufous.
- 17–27 cm.



- Australia and New Guinea.
- Woodland, shrubland and riparian habitats, one species in forest and secondary growth.
- 1 genus, 5 species, 10 taxa.
- No species threatened; none extinct since 1600.

### Systematics

Australasian babblers are medium-sized, largely insectivorous and terrestrial passerines occurring only in Australia and New Guinea. Relatively little work has been done on their relationships with other avian groups, but the studies of C. G. Sibley and J. E. Ahlquist, based on DNA–DNA hybridization, indicate that they are part of the large corvid radiation of songbirds centred on the Australo-Papuan region. The genetic studies reveal that the pomatostomids are a distinctive group, with the logrunners (Orthonychidae) and the jewel-babblers and allies (Eupetidae) as perhaps their closest relatives.

Despite the vernacular name, the Australasian babblers appear not to be related to the true babblers of the family Timaliidae, which include the similar-looking scimitar-babblers of the Asian genus *Pomatorhinus*. Indeed, they are sometimes referred to as “false babblers” or “pseudo-babblers”. Nevertheless, the Australasian babblers and the scimitar-babblers do share many common morphological features, particularly the general shape and plumage pattern, as well as certain details of bill structure and aspects of behaviour. Consequently, some earlier taxonomists considered the Australasian babblers to be closely related to the true babblers on the basis of their external morphology, but the recent genetic data do not support this treatment. Modern works typically place the family between Orthonychidae and Eupetidae, but a larger set of phylogenetic data is required in order to corroborate this sequence and to ascertain the genetic affinities between members of Pomatostomidae and other songbirds. Unfortunately, the fossil record provides no information on the ancestry of the family.

The family Pomatostomidae comprises five species, all united in one genus, *Pomatostomus*. Three Australian members of the family are largely adapted to arid and temperate areas, but the Grey-crowned Babbler (*Pomatostomus temporalis*), which occurs both in Australia and in southern New Guinea, can be found also in more humid and tropical environments. The fifth species, the New Guinea Babbler (*Pomatostomus isidorei*), is confined to its namesake island, where it occurs in tropical habitats. Some researchers suggest that the New Guinea Babbler should be placed in a different genus, *Garritornis*, on account of its yellow bill, as opposed to the mostly black bill of the other species, combined with its unusual rufous plumage

coloration and its distinctive pendent nests. There are also some DNA-sequencing data which indicate that the New Guinea Babbler clusters separately from the Australian species. Until further studies have been undertaken, however, it is probably wisest to retain all five species in *Pomatostomus*. Within the Australian species, the DNA-sequencing evidence suggests the existence of two phylogenetic groups, one comprising the Grey-crowned and Hall's Babblers (*Pomatostomus halli*) and the other containing the White-browed (*Pomatostomus superciliosus*) and Chestnut-crowned Babblers (*Pomatostomus*



The five species in Pomatostomidae differ only moderately in size. At the smaller end of the scale is the **White-browed Babbler**. As might be expected in a family comprising a single genus, the White-browed Babbler's plumage is typical of the family. All members are rather sombre in coloration, being typically brown, rufous or grey. Four of the five species have a white supercilium, although its breadth and prominence varies between species. The same four species have some white on the underparts, particularly on the throat and breast. Sexes are similar.

[*Pomatostomus superciliosus gilgandra*, Whychitella, Victoria, Australia.  
Photo: Peter Fuller]

The Australasian babblers are well adapted for their woodland or forest environment. Their short, broad and rounded wings are typical of sedentary understorey birds. Their strong legs facilitate their largely terrestrial life. The rather long, robust, decurved bill of the **Chestnut-crowned Babbler** helps it glean and probe for food. The head is slender and the body elongated, while the well-feathered tibiae give the babblers a "trousered" appearance. The long, broad, graduated tail has 12 rectrices, the central pair being the longest. It is often held fanned.

[*Pomatostomus ruficeps*,  
Hattah-Kulkyne  
National Park,  
North-western Victoria,  
Australia.  
Photo: Rob Drummond/  
Lochman Transparencies]



*ruficeps*). As some trends in plumage markings appear to support these infrageneric groupings, this topic merits further research. There is no evidence to suggest that any hybridization occurs among the members of the family.

Australasian babblers share many features with the unrelated Asian scimitar-babblers, particularly in external morphology. These include the slender head and long, decurved bill, the long broad tail with twelve rectrices, the rather short and broad wings with ten primaries, and strong legs and feet with scutellate tarsi, as well as unnotched tomia, or cutting edges, of the upper mandible. Like many timaliids, the Australasian babblers are gregarious and terrestrial, moving on the ground by means of hopping. Both groups also have rather sombre plumage patterns, and many Asian scimitar-babblers possess distinctive white supercilia, as do four of the five pomatostomids. On the other hand, there are numerous differences, mainly osteological, between the Australasian babblers and the true babblers. Features combining to distinguish the Pomatostomidae from other songbirds include distinctive temporal fossae, short postorbital and zygomatic processes, thick and heavily furrowed ectethmoid plates which are narrowly winged, absence of lachrymals, rudimentary ossification of the nares, a highly distinctive and ornate internasal septum, and a shallow keel on the sternum.

Most members of the Pomatostomidae exhibit little or no geographical variation in plumage and morphology. The Grey-crowned Babbler, however, displays distinct plumage and genetic variation within its range. North-west and central Australian populations of this species are more extensively rufous-breasted and have darker brown upperparts compared with those in southern and eastern Australia and New Guinea, which are smaller birds and have grey upperparts and a whiter breast. In addition, DNA-sequencing evidence indicates that the genetic differentiation between the two nearly approaches that normally found between full species. Some early authors did recognize two species, but most works treat the Grey-crowned Babbler as a single species, with two subspecies. Variation in the White-browed Babbler involves mainly subtle, possibly clinal, changes in plumage tone. The Chestnut-crowned and Hall's Babblers exhibit no apparent geographical variation in appearance. Finally, two subspecies of the New Guinea Babbler have been described, but the differences between them are not understood, nor are the geographical boundaries between them clear, and the validity of the subspecies is untested.

### Morphological Aspects

These medium-sized terrestrial passerines are largely adapted to woodland or forest environments. The five species differ only moderately in size, the Grey-crowned Babbler being on average the largest, with a length of 23–27 cm and weighing 60–85 g, and the White-browed Babbler the smallest, 17–22 cm long and 30–50 g in weight. Australasian babblers have a rather long, robust, decurved bill, short, broad and rounded wings, a rather elongated body with well-feathered tibiae, giving a "trousered" appearance, and a long, graduated tail with rounded tips. They have strong legs and feet, with laterally compressed tarsi which are smooth behind and scutellate in front. As mentioned previously (see Systematics), the tail comprises twelve rectrices, of which the central pair is the longest. The tail is often held partly fanned and can appear rather broad. The wings have ten primaries, of which one or more of the fourth to sixth outermost are the longest; the outer primaries have slight emarginations. There are nine fully developed secondaries, including three tertials, and up to three vestigial inner secondaries. It is believed that individuals vary in the number of these vestigial secondaries and the number of greater secondary wing-coverts that they possess.

The plumage is rather sombre, typically comprising brown, russet and grey coloration, and most species have distinct white or very pale supercilia. There is no apparent sexual dimorphism in plumage. The juvenile plumage is very similar to that of the adult, but the feathers of the underparts are more loosely textured, this being due to the lower density of barbs in juvenile feathers compared with those of adults. Juvenile tail feathers are narrower and more pointed at their tips than are those of adults.

Little information is available on the age at which the juvenile moult begins, but Grey-crowned Babblers apparently finish this moult when 4 months old. The juvenile moult, also termed the first pre-basic moult, is usually partial and involves all, or most, feathers of the head and body and most of the wing-coverts. In the case of the Grey-crowned Babbler, the majority of individuals replace the rectrices and at least some secondaries and outer primaries; young of this species which hatch early in the breeding season undergo a more extensive juvenile moult compared with those hatching late in the season. Juvenile White-browed Babblers apparently do not replace the rectrices or primaries in this moult, but more data are needed for this to be confirmed.





Australasian babblers are gregarious creatures, usually being seen in groups of up to 15 individuals. Larger congregations of up to 30 birds occur outside the breeding season. Group territory size varies considerably, that of the **Grey-crowned Babbler** ranging from 1.5 ha to 50 ha. Group-members typically forage, roost and preen in close company with each other. Allopreening is common, and is usually conducted by the group's primary female. The Grey-crowned Babbler is renowned for its "huddle display", in which group-members huddle together, crouch low and fan their tails, while the main breeding pair call antiphonally.

[*Pomatostomus temporalis temporalis*, Loddong River, Kerang, Victoria, Australia.  
Photo: Dean Ingwersen]

For all Australian pomatostomids, the juvenile moult usually results in a first immature plumage which very closely resembles that of the adult, but some Grey-crowned Babblers apparently moult directly from juvenile to adult plumage in a single complete moult. First-immature Grey-crowned and White-browed Babblers can be distinguished from adults by the fact that they exhibit a subtle contrast between the retained juvenile upperwing feathers, which have narrow brownish fringes, and the adult-like feathers, lacking brownish fringes, which are acquired in the juvenile moult. The adult plumage is probably gained when the bird is about one year old, in a complete first-immature post-breeding, or second pre-basic, moult. Grey-crowned Babblers do not acquire the adult iris coloration until they are at least 3 years of age.

Once adult plumage is attained, there is one complete post-breeding moult each year. Adults replace the primaries in a conventional outward sequence, the secondaries in an inward sequence, and the rectrices usually from the central pair outwards. The moult of the rectrices sometimes starts with the second innermost or, occasionally, occurs simultaneously across all of the feathers. Some individuals have been known to lose all the rectrices through stress or shock, as, for example, when captured and handled. Most Australian species start the adult post-breeding moult in middle to late spring or early summer, and complete it in late summer to early autumn. There are few data on the timing of moult of the New Guinea Babbler, but it is probable that this species' moult period is variable, as its breeding season in New Guinea extends over much of the year.

There is no evidence to suggest any seasonal variation in adult plumage, except for subtle changes in tone and darkness caused by feather wear. Adult female Grey-crowned Babblers exhibit greater wear of the primaries compared with the males, this being probably due to abrasion during the incubation process.

### Habitat

Temperate and arid-zone woodlands, shrublands and riparian habitats are the main haunts of the Australasian babblers, but the New Guinea Babbler occurs in forest and secondary growth. The

Australian species are usually found in lightly to moderately wooded country with a fairly open to fairly dense shrub understorey and open grassy or herbaceous ground cover. White-browed and Grey-crowned Babblers probably have the widest habitat preferences, typically open forest and woodland, and Grey-crowned Babblers occur also in savanna, monsoon forests and paperbark (*Melaleuca*) swamps in northern and humid parts of their range. The White-browed Babbler is often present in areas with a fairly dense shrubby understorey dominated by acacias (*Acacia*) and such genera as *Banksia*, *Cassia*, *Casuarina*, *Grevillea* and *Callitris*, and with a sparse ground cover including spinifex (*Triodia*) and small herbaceous species.

In southern and eastern Australia, Grey-crowned Babblers typically occur in woodland and open forest with an open understorey and a grassy ground cover with high levels of leaf litter and fallen timber. Studies in Victoria indicate that optimal habitat for this species comprises woodland on fertile soils with numerous mature eucalypts (*Eucalyptus*) or cypress pines (*Callitris*), an open shrub understorey with individual shrubs measuring 10–30 cm in diameter at breast height, and a sparse grassy ground cover with dense litter and fallen wood. In northern Australia and southern New Guinea, the Grey-crowned Babbler inhabits mainly eucalypt woodlands, often along watercourses, with a sparse to dense understorey including acacia, *Grevillea*, *Hakea* and/or *Livistona* palms.

Chestnut-crowned and Hall's Babblers live in open arid woodlands and shrublands, often dominated by mulga (*Acacia*) and with an open shrubby understorey comprising chenopods, such as bluebushes (*Maireana*) and saltbushes (*Atriplex*), as well as other shrubs such as acacias, emu-bushes (*Eremophila*) and hopbushes (*Dodonaea*). Hall's Babblers tend to occur on stony substrates with a denser mulga cover than that favoured by Chestnut-crowned and White-browed Babblers. In South Australia, Chestnut-crowned Babblers are often recorded in open arid woodland dominated by sugarwood (*Myoporum platycarpum*) and with an open understorey in which sheepbush (*Geijera linearifolia*) is the most prominent species.

The New Guinea Babbler is a forest inhabitant of lowland New Guinea, where it is often found in rainforest, monsoon forest and

secondary regrowth, particularly in areas with lawyer-vines (*Calamus*) and *Pandanus* palms. Such rainforest habitats more closely resemble those preferred by the scimitar-babblers of Asia.

Most pomatostomids normally shun highly altered vegetation or habitats, but White-browed Babblers sometimes forage on agricultural land and golf courses. White-browed Babblers tend to be less common in recently burnt areas, and in the mallee heathlands of south-eastern Australia they are often recorded in areas not burnt for 60–80 years. Grey-crowned Babblers are often seen in remnant vegetation along roadsides, and they, too, occasionally utilize agricultural land. The New Guinea Babbler is known to forage in planted teak (*Tectona*) forests.

The majority of the members of the family occur in low-lying areas, typically from sea-level to below 1000 m.

### General Habits

Australasian babblers are gregarious, active and mainly terrestrial birds. All five species are diurnal in activity. They are typically observed while foraging on the ground and among leaf litter or grasses, and sometimes on the lower parts of trees and shrubs. The New Guinea Babbler probably occurs in the upper canopy of the vegetation more often than the other species, but it will forage at a range of levels through the forest. Most species are readily approached and are not wary of the human observer, but, when disturbed, they will either hop away rapidly or fly in low, descending glides alternating with fairly short bouts of rapid wingbeats. When a flock is disturbed, it is common for one individual to follow the next until the entire flock has moved away from the source of possible danger. White-browed and Chestnut-crowned Babblers utter loud calls when captured in mist-nets, and this can result in the other members of the group flying into the net. When moving on the ground, these birds progress in short hops, often with the tail held partly fanned and cocked. They rarely perch atop shrubs or trees, but they do perch within vegetative cover in the low branches of trees or shrubs.

Most pomatostomids are readily detected both by sight and by sound, and their distinctive vocalizations (see Voice) usually provide a reliable means of locating them. Grey-crowned Babblers are often easily detected by their loud antiphonal “ya-hoo”

calls during the breeding season. The distinctive whistling and chattering notes of the other species are also excellent characters for identification in the field.

All members of the family are usually recorded in groups, typically of two to 15 individuals, and larger groups containing up to 30 birds have sometimes been reported. In the case of some species, large groups observed in the non-breeding season break up into smaller parties during the breeding season. For example, flocks of 20–25 Hall’s Babblers have been recorded in May, whereas in August, at the same site, these had fragmented into groups comprising a breeding pair and one to three helpers. Similarly, during the breeding season, groups of White-browed Babblers often break up into smaller units or pairs, and pairs are often seen to forage alone within the group territory. Group structure has been studied most intensively in respect of the Grey-crowned and White-browed Babblers. Breeding groups of the former consist of a pair of primary adults, each of which is more than 3 years old, and a varying number of helpers, which are typically the offspring of the pair from the previous breeding season. There are occasional instances of a group containing more than one breeding pair, and in such cases more than one clutch is laid in the breeding nest. White-browed Babblers have a similar group structure, but a fairly high proportion of helpers, 40% in one study, are the offspring from another group. The average group size of White-browed Babblers varies, but studies in Western Australia give a mean of 5.4–6.9 individuals over three years, most groups comprising the primary breeding pair and 2–4 helpers, or auxiliaries. The role of auxiliaries, as well as other aspects of breeding-group behaviour, is discussed later (see Breeding).

White-browed Babblers occupy permanent, overlapping home ranges, and some agonistic behaviour occurs when members of adjacent groups come into contact, at least in the breeding season. During the non-breeding season, however, members of neighbouring groups, or even entire groups, intermingle in a non-aggressive manner far more than they do when breeding. Home ranges of groups are not obviously correlated with group size, but are known to vary seasonally. In the case of White-browed Babblers, the home range of groups in the non-breeding season tends to be larger than the breeding range. For example, in one study in Western Australia, the average home range of groups was estimated at 6.6 ha and the average size of the breeding terri-

The pomatostomids have loud, distinctive calls that are often the first sign of their presence. The vocal repertoire of most species is rather wide, including simple whistles, chattering, churring and bubbling as well as staccato notes and harsh alarm calls. The New Guinea Babbler is anomalous in this respect, as it possesses different vocalizations. Foraging groups are rather quiet, although birds keep contact with a low, hoarse call. Flocks also give a deep and rasping vocalization and a rising, nasal alarm call. Birds in some mixed-species flocks even appear to mimic the Rusty Pitohui (*Pitohui ferrugineus*).

[*Pomatostomus isidorei isidorei*,  
Brown River,  
SE New Guinea.  
Photo: Brian J. Coates]





tory was 4 ha; similarly, the range of a group in northern Victoria was smallest in the spring breeding season, at 2.6 ha, and largest in autumn and winter, when it covered 8.3 ha. Radio-tagging studies of White-browed Babblers have revealed that home ranges during the breeding season in patches of remnant native vegetation are larger than those in narrow linear strips of vegetation; there is also evidence indicating that group size tends to be larger in remnant vegetation patches compared with linear strips.

The home range of the Grey-crowned Babbler varies greatly, from 1.5 ha to more than 50 ha. New Guinea Babblers hold permanent group territories of about 4 ha, and demonstrate aggression towards any other flock of babblers that enters the territory.

Group-members forage, roost, preen and dust-bathe together, typically keeping within several metres of each other. Grey-crowned Babblers often clump together and engage in allopreening and other activities, particularly after leaving roosts in the morning, and during the heat of the afternoon. Allopreening by this species is fairly well documented, and is apparently conducted most often by the primary female and least often by young females. Another interesting aspect of group behaviour among Grey-crowned Babblers is a "huddle display", in which all members of the group huddle together, holding the body in a low crouched position and fanning the tail, while the primary breeding pair starts antiphonal calling (see Voice) and the other members give loud chuckling calls. Dust-bathing is also conducted in groups, and sessions can last for several minutes.

Roosting, too, is fairly well documented for some species in this family. Group-members build and maintain several roosting nests and roost together overnight in these structures, but during the breeding season the primary female roosts alone with her eggs or young. The birds enter the roosts shortly before sunset and leave early in the morning. The benefits of roosting as a group are probably heat conservation and the control of ectoparasites through allopreening activities. The roosting behaviour of Grey-crowned Babblers has been well studied. The times at which sunrise and sunset occur are the most important determinants of this species' departure and arrival times at the roost, with light intensity and cloud cover also significant variables affecting roosting times. The babblers leave the roost quietly in the morning, but call loudly when arriving at the roost in the evening. Fledglings need to be coaxed into the roost nest by the primary pair and

older auxiliary birds. Roosting nests are discussed further below (see Breeding).

Some of the Australasian babblers are known to form mixed-species flocks. White-browed Babblers have been recorded in feeding flocks with such species as the Variegated Fairy-wren (*Malurus lamberti*), the Crested Bellbird (*Oreoica gutturalis*) and the White-browed Scrubwren (*Sericornis frontalis*). New Guinea Babblers are often seen in close company with other species, among them the Spangled Drongo (*Dicrurus bracteatus*), Tawny Straightbill (*Timeliopsis griseigula*), Black Butcherbird (*Cracticus quoyi*), female-plumaged King Bird-of-paradise (*Cicinnurus regius*), Magnificent Riflebird (*Ptiloris magnificus*), New Guinea Cuckoo-shrike (*Coracina melas*) and Sooty Thicket-fantail (*Rhipidura threnothorax*). New Guinea Babblers appear to lead these mixed-species feeding flocks, which consist of birds having predominantly brown, black and grey plumages. The close resemblance in plumage colour and calls shown by the New Guinea Babbler, the Rusty Pitohui (*Pitohui ferrugineus*), the Tawny Straightbill and female cuckoo-shrikes is thought to be an example of social mimicry, which acts to maintain cohesion of mixed-species flocks. Aggression towards other species sometimes occurs, and pomatostomids are known also to mob species which represent a real or perceived threat, such as cats, dogs and raptors.

### Voice

The pomatostomids have distinctive, often loud calls, and their vocalizations frequently reveal their presence before the birds themselves are sighted. Most members of the family have a fairly wide vocal repertoire. This includes fairly simple whistles, churring, chattering or buzzing notes, loud caterwauling, complex bubbling notes, antiphonal duets, staccato notes and harsh alarm calls. Although the Australasian babblers' calls are often fairly loud, they include a variety of soft and subdued notes, too. These birds utter vocalizations when foraging on the ground, when perched in vegetation, and during flight, and females sometimes emit calls while they are incubating or brooding young. Vocal activity is generally restricted to the daytime period, but White-browed Babblers are known occasionally to call at night. The calls of the Grey-crowned Babbler are the best understood, al-



Australasian babblers feed primarily on arthropods. The Grey-crowned Babbler mainly eats weevils, beetles, grasshoppers, bugs and, as here, caterpillars.

The family tends to feed on the ground or in low shrubs and trees. The Grey-crowned Babbler is the most arboreal species, typically feeding on trunks and dead branches at a height of about 2–7 m. However, the species spends about a quarter of its foraging time on the ground. It obtains most of its prey by probing and gleaning, regularly investigating crevices in termite mounds to extract their occupants.

[*Pomatostomus temporalis* temporalis, Australia.

Photo: Roland Seitre]

**The White-browed Babbler** spends most of the day foraging, mainly on the ground in leaf litter and among low shrubs. In spring, however, it uses a wider variety of substrates. Its diet comprises a wide variety of insects, from ants and wasps to beetles and grasshoppers, and it also predares the eggs and nestlings of birds such as the Splendid Fairy-wren (*Malurus splendens*). In addition to gleaning and probing for its prey, the species digs into leaf litter and sand by flicking the bill sideways. It also holds hard berries and almonds under one foot and uses the bill to hammer the seeds out.

[*Pomatostomus superciliosus gilgandra*, Maryborough, Victoria, Australia. Photo: Peter Fuller]



though the functions of many of its vocalizations are not known for certain. Many calls appear to play an important role in the routine and effective functioning of the group.

The Grey-crowned Babbler is the only species in the family known to give antiphonal vocalizations. These comprise a loud "ya-hoo" duet in which the primary breeding male of a group utters a high "awoo" and the breeding female gives a harsh "yah" in response, the whole being repeated 8–23 times. The sound frequency of the notes is usually less than 2 kHz. The duet is performed only by the primary breeding pair, and is often given when the birds are huddled together in a display, which can last for more than 40 seconds; it is sometimes preceded by noisy chuckling calls uttered by several members of the group, as well as by the breeding pair. This huddle display (see General Habits) sometimes occurs without antiphonal duets, and it can take place at various times of the year, rather than being confined to the breeding season. The breeding male of the group is known also to give a disyllabic "wee-oo" call, instead of "awoo", antiphonally during the huddle display. Other loud calls emitted by Grey-crowned Babblers include a disyllabic "ook-ai", which acts as a contact call but is also given antiphonally by either sex of the breeding pair. These loud calls can carry up to 200 m. Other commonly uttered vocalizations include a soft "chuck" or "chuck chuck" as a contact call, sometimes when the bird is foraging on the ground. The "chuck" is given by all, or most, members of the group on a fairly frequent basis, each individual calling at intervals of less than 1 minute. When alarmed by a flying raptor, Grey-crowned Babblers emit a high-pitched whistle, "who-oo", before the group flies to cover. Other alarm calls include a short, harsh "skak" and series of similar scolding notes, given by a varying number of group-members.

Although White-browed Babblers do not give antiphonal duets, they do make a large variety of whistling, churring, bubbling, chattering and scolding sounds. They often utter scolding and chattering notes when responding to an intruder, whether human or other, in their home range. One of the most common calls is a soft "tuk", given during foraging and possibly acting as a contact call to keep the group-members together; it may thus serve a similar function to that of the "chuck" call of Grey-crowned Babblers. White-browed Babblers give a loud "shack-shack-shack"

in alarm, particularly in such situations as that when an individual is separated from the rest of its group by a human observer. They produce a noisy chattering when building roost-nests, and also a loud bubbling chatter when engaging in sexual displays (see Breeding). In addition, they emit loud caterwauling, nasal calls and penetrating clear whistles, but little is known about the function or role of these in the context of the group's behaviour.

Knowledge of the vocalizations of Hall's and Chestnut-crowned Babblers is limited. Chestnut-crowned Babblers give a variety of calls, including a loud plaintive whistle, "we-chee chee chee", the frequency of which is generally 1–4 kHz. This species commonly utters a loud "chack-chack" in alarm, as well as continuous chattering when foraging on the ground. Chestnut-crowned Babblers are said to have a melodious song, but there are few details of this, and songs are not well described for any member of the family. Hall's Babbler commonly emits a "chirp" call, sometimes twice in quick succession. One or more individuals of this species will give loud "buzz" calls when alarmed, and in response the members of the group fly up into trees and continue to utter the same buzzing notes. The breeding female, just before leaving or entering the nest, sometimes produces a melodious song which can last for up to 8 minutes. In addition, Hall's Babblers not only have a variety of other calls, including chattering, clucking and loud staccato notes, but are known also to produce non-vocal sounds by striking the bill on the ground.

New Guinea Babblers are said to be rather quiet when foraging, but they do have a contact call, which is a low, hoarse descending "work" or "whaak", often preceded by a short, high-pitched upslurred "whi-work". Another contact call of this species is a low "phew" or "few" whistle, repeated several times, and used only when in mixed-species feeding flocks with Rusty Pitohuis, which give a very similar call. This may be an example of mimicry by a pomatostomid babbler. Otherwise, flocks of New Guinea Babblers emit a loud, deep and rasping "whu-whui", and in alarm give a rising nasal "hu-wick" or "who-who-whi-whick" before flying away for a short distance. It would appear, therefore, that the vocalizations of the New Guinea Babbler generally differ significantly from those of the Australian members of the family, but the former is known to give a loud "ya hoo" similar to that of the Grey-crowned Babbler.



There is no evidence to suggest any intraspecific geographical variation in calls. Age-related variation in vocalizations, however, is a normal situation, as it is with most other avian families. Fledgling Grey-crowned Babblers, for example, give a begging squeak when approached by conspecifics, and they utter calls intermediate between this and the adult's "chuck" call when foraging with the group, possibly as a contact call. Nestlings and fledglings of the White-browed and Chestnut-crowned Babblers also give begging calls, but there is no information on the calls of young Hall's Babblers.

### Food and Feeding

Australasian babblers feed mainly on arthropods, but they do take some seeds, fruits and occasionally small vertebrate animals. Although they gather food items generally from the ground, they will forage also in low shrubs and trees. The Grey-crowned Babbler spends less time in foraging on the ground and is the most arboreal of the four Australian pomatostomids, and the New Guinea Babbler forages at a variety of heights in the forest. Australasian babblers feed in groups, often flying rapidly between sites or moving gradually while foraging.

The White-browed Babbler is the most studied in terms of food and feeding, but there is some detailed information also on the feeding habits and prey of the Grey-crowned Babbler. Detailed studies covering much of the former species' geographical range indicate that the adults feed mainly on insects, including beetles (Coleoptera), termites (of family Termitidae), ants and wasps (Hymenoptera), bugs (Hemiptera), cockroaches (Blattodea), larvae of butterflies (Lepidoptera) and grasshoppers (Orthoptera). Small animals such as spiders (Araneae) and scorpions (Scorpiones) are also taken. Adult White-browed Babblers also take eggs and young of other birds, including those of House Sparrows (*Passer domesticus*) and Splendid Fairy-wrens (*Malurus splendens*). In addition, they consume various seeds, including those of grasses, of chenopods such as *Enchylaena* and *Rhagodia* species, and of acacias, and they eat fruits, including those of *Exocarpus* and chenopods. In one study in Western Australia, seeds formed a larger component of the diet in the summer, when they were present in 14% of faecal samples, than they

did in the spring, when they were found in only 8% of samples. Grey-crowned Babblers are known to take small reptiles occasionally and to ingest grit, and it seems likely that the other members of the family do likewise. New Guinea Babblers feed mainly on insects, but also on spiders, scorpions and small reptiles.

There are few records of Australasian babblers drinking water. White-browed Babblers have been observed to drink from a water trough and New Guinea Babblers occasionally drink from small forest pools in dry weather conditions.

Nestlings and fledglings are fed by both parents and by other members of the group. The diet of nestling White-browed Babblers has been studied, and this comprises insects, spiders, millipedes (Diplopoda), scorpions, and small reptiles such as skinks (Scincidae) and geckos (Gekkonidae).

Observations on White-browed Babblers in Victoria indicate that this species spends most of the daytime in foraging, the proportion ranging from 52% of the day in spring to 72% during the winter months. Foraging strategies, including behaviour, and sites and heights exploited, vary among species and also geographically and seasonally within species. The Grey-crowned Babbler gathers food items from a variety of substrates and at various heights. Of observations of this species' feeding behaviour made in one study at Kakadu National Park, in north Australia, 28% involved feeding from the ground, 26% from trunks and large tree branches, 23% on dead branches, 14% from inner foliage, 5% from outer foliage, 2% among dead leaves and 2% in shrubs. Foraging heights varied from ground level, which accounted for 26% of observations, to above 14 m, which made up just 2%, with 7% at 1–2 m above ground, 49% at 2–7 m and 16% at 8–14 m. For comparison, studies of the White-browed Babbler in Victoria and Western Australia revealed that this species spent most of its time in foraging on the ground, with less time spent in shrubs and trees; indeed, in one study, up to 99% of the time was taken up with terrestrial foraging. In one study in Western Australia, it was found that White-browed Babblers foraged mainly on the ground, in leaf litter and low shrubland, in March and April, but that they utilized a wider variety of substrates in August and September. Hall's and Chestnut-crowned Babblers likewise seek their food mainly on the ground, but occasionally in shrubs and on tree trunks and branches. New Guinea Babblers forage by gleaning on the ground, among leaf debris in root but-



There are few observations of pomatostomids drinking, and they may well get sufficient water from their prey. Indeed, only two species have been seen to drink. One is the White-browed Babbler (*Pomatostomus superciliosus*), which has been watched drinking from a water trough. The other is the New Guinea Babbler, which, during dry weather conditions, occasionally drinks from small pools in the forest. The diet of this species is poorly known. Like its congeners, the main prey is probably insects, but it is also known to take spiders and small reptiles.

[*Pomatostomus isidorei isidorei*, Brown River, SE New Guinea. Photo: Brian J. Coates]

Australasian babblers are co-operative breeders. Breeding groups usually comprise a single primary monogamous pair (occasionally two pairs), supported by a cast of up to six helpers, which are usually siblings or offspring of the main pair. With the **Grey-crowned Babbler**, most or all group-members gather nest material, as seen here. They also help construct both brood-nests and roost-nests, although the main breeding pair takes overall responsibility for their completion. At times, helper or auxiliary males assist the primary male in feeding the incubating primary female, and a secondary female sometimes helps out with incubating and brooding duties.

[*Pomatostomus temporalis rubeculus*,  
N Australia.  
Photo: Eric & Leslie  
McCabe]



tresses or among foliage, among palms fronds, on trunks and on the surface of termitaria.

Most food is obtained by gleaning and probing, the bill often being used as a means of overturning large objects in order to find hidden prey or to extract prey from loose bark or crevices. Aerial sallying appears to be a rarely employed technique. Grey-crowned and New Guinea Babblers probe into the base and crevices of termitaria to obtain termites, and White-browed Babblers dig into leaf litter and sand by using a sideways-flicking movement of the bill. The last-mentioned species has been observed to employ more novel feeding techniques, such as holding hard berries and almonds under one foot and using the bill to hammer the seed out. Similarly, the New Guinea Babbler is known to secure larger prey in one foot while tearing it apart with the bill.

Pomatostomids forage generally in groups of up to 15 individuals, and sometimes in larger groups. Occasionally, partners will seek food together as a single pair. Feeding groups of White-browed Babblers tend to be larger in the non-breeding season, and sometimes members of two or more different groups will forage together. These feeding interactions between groups typically occur in the non-breeding season and do not involve agonistic behaviour. Mixed-species feeding flocks have been discussed earlier (see General Habits).

### Breeding

Most of the information on the reproductive behaviour of this family is based on observations of Grey-crowned and White-browed Babblers; the breeding biology of the Chestnut-crowned, Hall's and the New Guinea Babblers is poorly understood. Nevertheless, basic data concerning the timing of the breeding season, the nest structure and site, the clutch size and the egg pigmentation are available for all species except the New Guinea Babbler.

Apparently all of the species are territorial, but little is known about the territoriality of New Guinea Babblers. Australasian babblers are co-operative breeders, and breeding groups typically

comprise a primary monogamous pair and a varying number of helpers, or auxiliaries. For those species which have been sufficiently well studied, the pair-bond is apparently very stable and is maintained not only throughout the year, but also from one year to the next. In the case of Grey-crowned Babblers, a primary breeding individual will re-pair if its mate dies, and the replacement is either a non-breeding adult or a "subadult", probably 2–3 years old, from the same group or another one. Some groups have more than one breeding pair.

The breeding season is extended, with breeding recorded for all species in most months. White-browed and Grey-crowned Babblers can raise more than one clutch in a season, and up to four broods have been documented. About 90% of Grey-crowned Babbler clutches are from the period July–December, but breeding in northern Queensland occurs more often in autumn–winter than is the case in southern and central Australia. For White-browed Babblers, about 70% of clutches are laid from late July to October. Eggs of Hall's Babblers have been recorded in all months except July, and eggs of Chestnut-crowned Babblers have been found in June–December. New Guinea Babblers construct their nests in January–February, July–September and November, but there is no information on the precise timing of laying. This species breeds mainly in spring to early summer, as do most other insectivorous birds in New Guinea. Little is known about the relationship between climatic conditions and the timing of breeding of Australasian babblers. The peak of laying varies from year to year at some locations, suggesting that local conditions may influence the timing of events.

Courtship and sexual behaviour have been observed for some members of the family. One of the most distinctive courtship displays involves antiphonal duetting by Grey-crowned Babblers. These duets are thought to assist in maintaining the pair-bond. This species also engages in pre-copulatory displays in which the two partners face each other in an upright stance and touch bills together, just prior to the male mounting the female. Display and copulation combined last for only about ten seconds or less, and displays are not always performed prior to copulation.





White-browed Babblers engage in various courtship displays involving neck-stretching and wing-fluttering while uttering chattering calls. The male of this species has been observed to jump over the female, sometimes prior to copulation.

Agonistic behaviour plays an important role in maintaining group structure, establishing hierarchies and asserting territoriality of the group. Such behaviour includes chasing, fighting, submissive display, threat display, alarm-calling and other calling displays. Fighting by Grey-crowned Babblers involves two perched individuals pulling each other's bill, or pecking and locking feet while on the ground. Mate-guarding has been noted for White-browed Babblers, the dominant males of a group accompanying females to and from nests at the start of the breeding season.

Australasian babblers construct breeding and roosting nests in colonies. For those species studied, the entire group roosts in one of several large enclosed roosting nests which are placed within the group territory. Studies of Grey-crowned Babblers have provided evidence to indicate that breeding can take place in nests previously used for roosting, and that the birds may roost in nests previously used for breeding. It is thought that the lack of mites (Acarina), hippoboscids and other ectoparasites may encourage the reuse of nests. During the breeding season, the primary breeding female roosts alone in the breeding nest.

Grey-crowned Babblers usually place their nests within 50 m of each other, and densities of up to 20 nests within 90 m<sup>2</sup> are known. Much the same applies to White-browed Babblers. In the case of Hall's Babblers, up to seven nests have been recorded within an area of about 1 ha. Similarly, New Guinea Babblers place their nests close to each other, with records of up to four nests built within an area measuring 2 m in the vertical plane and 2 m horizontally. In all instances, however, it is usual for only one nest to be in use at any given time. The size of home ranges of Grey-crowned Babblers varies from 1.5 ha to 50 ha or more, and size of home range is not always directly correlated with group size. The breeding territory of White-browed Babblers is typically smaller than the total home range of the group. For example, in one study in Western Australia, the breeding range of groups was on average 65% smaller than the total home range in the non-breeding season.

Pomatostomid nests are generally placed in small trees or tall shrubs, but New Guinea Babblers often build their nests in

the tendrils of hanging vines, and sometimes around vines which descend from high branches. Nests are typically sited at least 0.5 m above the ground. Those of Hall's and Chestnut-crowned Babblers are 3–10 m above the ground, usually in the fork of a mulga or other tree or tall shrub. White-browed Babblers tend to build at lower levels, usually 0.5–6 m above ground in the dense terminal foliage, outer branches and forks of trees and tall shrubs. Various species of the genus *Acacia* are commonly used as nesting substrate by White-browed Babblers, and other plants used by this species include paperbarks, eucalypts, cypress pines (*Callitris*), *Eremophila*, *Grevillea* and *Hakea*. Grey-crowned Babblers build their nests in a similar variety of plants but often higher, up to 15 m above ground.

Occasionally, other bird species will use pomatostomid nests. Blue-faced Honeyeaters (*Entomyzon cyanotis*), for example, are known to lay eggs in Grey-crowned Babbler nests or to place their nests on top of those of babblers, and Yellow-rumped Thornbills (*Acanthiza chrysorrhoa*) will sometimes site their nest underneath a Grey-crowned Babbler nest. Conversely, White-browed Babblers occasionally build on top of the nest of another species, such as Gilbert's Whistler (*Pachycephala inornata*) or one of the whitefaces (*Aphelocephala*).

With Grey-crowned Babblers, all or most members of the group assist with the building of brood-nests and roost-nests, but the primary breeding pair, particularly the female thereof, provides the greatest contribution to the work of nest construction. One study of White-browed Babblers in Western Australia showed that the brood-nest is built by the primary breeding pair, or sometimes by the breeding female only, but that roost-nests are built by all members of the group. White-browed Babblers have been observed to complete the construction work in as little as two days, but nest-building probably takes longer than this on average. Estimates of the time taken by Grey-crowned Babblers to construct nests vary from a few days to three months. There may be some variation in the timing of construction of brood-nests and roost-nests. For example, in south-eastern Queensland, Grey-crowned Babblers construct brood-nests during July to November, but they build roost-nests from December to March. Nest construction of Hall's, Chestnut-crowned and New Guinea Babblers is poorly documented.

Nests are typically large, rather bulky dome-shaped structures, often with a spout-like or hooded side entrance or tunnel

Australasian babbler nests are typically large, bulky, dome-shaped structures. Most have a hooded side entrance or tunnel leading to the nest chamber.

**Grey-crowned Babbler** nests tend to be up to 50 cm in external diameter, and taller than they are wide. Nests are constructed from sticks, grasses, bark, dung and rootlets. The internal chamber is made of finer materials, and the bottom of the nest has a soft lining of feathers, wool and plant down. Pomatostomid nests are usually sited in a tree or tall shrub at least 0.5 m above the ground; those of the Grey-crowned Babbler tend to be higher than those of their congeners, at 15 m up or more.

[*Pomatostomus temporalis temporalis*, Goomboorian, near Gympie, SE Queensland, Australia. Photo: Cyril Webster]



leading to the nest-chamber. The New Guinea Babbler builds a pendent domed nest with a long "tail". The latter species has the largest of all pomatostomid nests, 1–2 m long, with an internal chamber about 30 cm wide and a hanging tail of about 50 cm. Chestnut-crowned Babblers have the largest nest of the Australasian species, with an external height of 50 cm and width of 30 cm; its entrance measures 7 cm in diameter. Nests of Grey-crowned Babblers have an external diameter of 30–50 cm, the height greater than the width, with an internal diameter of 10–13 cm and an entrance 5–7 cm wide. White-browed Babbler nests are slightly smaller than those of the other species, having an external diameter of about 25 cm and the entrance about 5 cm wide. The nests of the Australian members of the family are constructed from sticks, grasses, bark, dung and rootlets, and lined with dry grass, feathers, wool and fur, moss, plant down and occasionally paper, cloth or even cigarette butts. The internal chamber is made of finer materials than those used in the external part, and the bottom of the nest is lined with feathers, wool, plant down and other soft materials, in which the eggs are hidden when the nest is left unattended. New Guinea Babblers construct their nests from long stems of creepers, vines and dried palm fibres, and line them with bamboo leaves, palm fronds and skeletonized tree leaves. Some species will build nests from the materials of previously used or damaged ones.

Australasian babblers lay elliptical to oval-shaped eggs which are smooth and lustrous or glossy. The eggs of the New Guinea Babbler are undescribed in the literature. Those of the Australian species have very diagnostic pigmentation, the ground colour varying from grey or greyish-brown to brown or buff, and being densely marbled, veined or streaked with blackish, dark brown or reddish, the markings often denser towards the larger end of the egg. The White-browed Babbler usually has less heavily marked eggs than those of other Australian species. Clutch size varies rather widely: the White-browed Babbler lays 1–6 eggs, the Grey-crowned Babbler 2–6, the Chestnut-crowned Babbler 3–5 and Hall's Babbler possibly only one or two eggs. Clutches of up to 14 eggs have been recorded, but these are probably incidences of more than one female laying in the brood-nest. The clutch size of the Grey-crowned Babbler is thought to be directly correlated with rainfall and inversely related to evaporation rate, with large clutches more frequent in coastal areas compared with

inland sites. Double and multiple brooding has been recorded, and for White-browed Babblers the interval between the fledging of young from one nest and re-laying ranges from 15 days to 41 days.

For those species for which the relevant information is available, the eggs are apparently laid at 24-hour intervals and incubation is usually undertaken by the breeding female alone, but occasionally a second, auxiliary female incubates. The primary breeding male and, sometimes, auxiliary males assist the incubating female by bringing her food or nesting material. The incubation period is 19–20 days for White-browed Babblers and 21–25 days for Grey-crowned Babblers, but there is no published information for other members of the family. On hatching, young pomatostomids are blind and naked, or perhaps have some sparse down on the dorsum. They are, naturally, altricial and nidicolous. Within a few days of hatching, chicks of the four Australian species, at least, develop several denser patches of whitish or greyish down on the top of the head, the dorsum, the humerus and the femur. Within about one week the feathers start to erupt from the sheaths, and nestlings are well feathered by about two weeks of age. Nestlings of the Grey-crowned Babbler are fully feathered 2–3 weeks after hatching. The primary breeding female broods the young, but sometimes a second female also broods them. All or most members of the group feed the chicks and remove faecal sacs from the nest. The fledging period is known only for the Grey-crowned Babbler and the White-browed Babbler, the respective figures being 17–23 days and 16–17 days.

After having left the nest, fledglings stay close to the parents, and there are documented instances of young being fed by the parents several months after fledging. Juveniles normally remain in the natal territory during the first year or longer, and often become helpers of the group during the ensuing breeding season. The age at which the birds first breed is 2–4 years, and in the Grey-crowned Babbler the gonads of both sexes are not fully developed until the individual is at least 2 years old.

Some data on breeding success are available for the two best-known members of the family, the White-browed and Grey-crowned Babblers. In studies of White-browed Babblers, hatching success was up to 60% in some cases, and fledging success about 16%, with about 50% of nests producing at least one young. For Grey-crowned Babblers, hatching success is up to 70% and at

The primary female White-browed Babbler incubates her clutch of up to six eggs for 19–20 days. The bird here is probably the primary male or a helper male returning to feed an incubating female or nestlings. Chicks hatch naked, but the feathers start to emerge after seven days. Fully feathered after two weeks, they leave the nest two or three days later. Some 30–60% of White-browed Babbler eggs hatch, and fledging success is around 16%. Nest failure is usually due to predators, such as snakes, goanna lizards (*Varanus*), other bird species and feral cats; or nest parasitism by cuckoos.

[*Pomatostomus superciliosus*.  
Photo: ANT/NHPA]





least 30% of nests result in one or more young fledging. Breeding success of the latter species is lower when group size is smaller, and the weight of the primary male is directly correlated with breeding success of the group. Group size is also directly correlated with breeding success of White-browed Babblers, groups of 7–13 individuals in linear home ranges fledging an average of 2.7 young per group and those of 2–6 in linear home ranges fledging an average of 0.7 young. The presence of helpers improves the reproductive success of the breeding pair. Nest failure is often due to predation by other bird species, and by snakes, goannas (*Varanus*) and feral cats. Corvids such as the Torresian Crow (*Corvus orru*) often take eggs or nestlings of Grey-crowned Babblers after poking a hole in the roof of the nest or tearing the nest apart. Parasitism of White-browed Babbler nests by Pallid Cuckoos (*Cuculus pallidus*) and Black-eared Cuckoos (*Chrysococcyx osculans*) has been documented.

Longevity of pomatostomids is poorly understood, but ringed individuals of the White-browed Babbler are known to have lived for up to 14 years. The annual mean survival rate of this species has been estimated at about 80%. Juvenile survival rate is probably lower than that of adults, particularly in the first six months of life.

## Movements

Australasian babblers are generally considered sedentary and territorial. There are some instances of individuals moving several kilometres away from territories, but it is not known whether these are examples of local nomadism or of expansion of home ranges. Ringing studies of White-browed and Grey-crowned Babblers indicate that the birds generally do not move long distances but, instead, remain in territories throughout the year. Recapture rates tend to be high, and distances moved are usually of up to no more than a few hundred metres from the site of original ringing. The longest known movement of ringed individuals is about 25 km, made by two Grey-crowned Babblers in Queensland. Local nomadism is thought to be an occasional feature of Grey-crowned Babblers in dry inland areas of Queensland, and vagrants occasionally appear in some areas such as the Torres Strait. Ringing results indicate that Chestnut-crowned Babblers also remain in their territories, with occasional dispersal of up to

several kilometres. Similarly, Hall's and New Guinea Babblers are sedentary, but relatively few have been ringed. In observations of New Guinea Babblers, one group was seen to move no more than 250 m among six feeding sites in a forest.

As mentioned earlier (see Breeding), juveniles stay close to the natal site in their first year. By the time they are 2–3 years old, White-browed Babblers may have moved up to 500 m from the site.

## Relationship with Man

There is little information on the interactions of this family with humans. Indigenous people in Australia have various names for the Grey-crowned and White-browed Babblers, probably reflecting the extensive distributions of these species and indicating that they are familiar with them. Equally, native New Guinean people have a knowledge of the habits of New Guinea Babblers, including their roosting behaviour.

Anecdotal information suggests that White-browed Babblers became accustomed to orchards, gardens and farm buildings, but what influence, if any, they had on the human settlers in the region is not known.

Populations of Grey-crowned Babblers in northern Australia appear to be more tolerant of human activity compared with those in the southern part of the continent, and it is not unusual for this species to forage close to buildings and homes in parts of north-eastern Queensland. Some human-made materials, including paper, adhesive tape, cigarette butts and cloth, are used by pomatostomids for nest construction. There appear, however, to be no records of nests placed in artificial structures.

## Status and Conservation

No species of Australasian babbler is considered to be globally threatened. Three species, the Grey-crowned, Hall's and White-browed Babblers, have populations that are classed as threatened in certain Australian states. While most members of the family have a fairly widespread distribution, local changes in habitat quality have had a significant impact on populations of certain species.



Once they have left the nest, fledgling Australasian babblers stay close to their parents. They are fed by them, as with this Grey-crowned Babbler adult and well-grown youngster, and this provisioning can continue for some months. While labour-intensive, such concerted parental care increases the chance of their offspring making it through the risky first year. Juveniles normally stay in their natal territory for this period, and many help their parents the following year. Pomatostomids do not generally breed until they are 2–4 years old; indeed, Grey-crowned Babblers are only sexually mature at two.

[*Pomatostomus temporalis*  
*temporalis*,  
Deniliquin,  
New South Wales,  
Australia.  
Photo: Andy & Gill Swash]

No species of Australasian babbler is considered globally threatened and none qualifies as a restricted-range species. Nevertheless, local changes in habitat quality have had a significant impact on populations of certain species. Three species are classed as locally threatened in at least one of the Australian states in which they occur. **Hall's Babbler** is one, being considered "vulnerable" in New South Wales, where the population has declined due to habitat clearance and overgrazing. Elsewhere, however, it can be fairly common.

[*Pomatostomus halli*,  
Yowah, Queensland,  
Australia.

Photo: Graeme Chapman]



The Grey-crowned Babbler is classed as "near-threatened" in eastern Australia, and "endangered" in Victoria and South Australia. Populations of this species have declined dramatically in many part of south-eastern Australia, mainly as a result of the clearance and fragmentation of native vegetation, particularly buloke (*Allocasuarina luehmannii*) and native-pine woodlands. The removal of fallen timber for firewood, the grazing of remnant woodland by livestock and rabbits (*Oryctolagus*), the invasion of native vegetation by introduced weeds, and an increase in fuel-reduction burning along roadsides are also factors contributing to declines in populations. Reduction in group size has a detrimental impact on the reproductive success of Grey-crowned Babblers. The nominate race of this species is possibly already extinct in South Australia, having last been recorded in the 1980s in woodlands in the south-eastern part of that state. Populations of the nominate race have declined dramatically in Victoria, and also in parts of New South Wales, Australian Capital Territory and south-eastern Queensland. It is quite possible that the Victoria population has declined by 95% compared with its numbers prior to European settlement. A good example of the dramatic reduction in Grey-crowned Babbler numbers here is presented by the situation on the Mornington Peninsula, south-east of Melbourne, where the species was widespread and common in the early 1900s, but had declined to fewer than five groups, totalling about 13 individuals, by the 1990s. This massive decrease is due to land clearance for agriculture and, more recently, to rapacious land subdivision for urban development. Other populations in southern Victoria have been seriously reduced, and those in the grassy woodlands near Melbourne, Ballarat, Geelong and the Little Desert have disappeared entirely. The total Victoria population is estimated at 1400–1900 birds, most of these in the northern-central parts of the state. Less is known about changes in this species' status in northern Australia, but populations around Darwin have certainly declined. The introduction of exotic grasses such as *Andropogon* has probably reduced habitat quality for this pomatostomid in parts of northern Australia.

Similar issues affect populations of White-browed Babblers in southern Australia. In south-west Western Australia, the species is considered "threatened". It was once widespread on the Adelaide plains, in South Australia, but has virtually disappeared from much of that region as a result of habitat clearance and ur-

banization. Altered fire regimes may also adversely affect this species. For example, in karri (*Eucalyptus diversicolor*) forests of Western Australia, White-browed Babblers typically occur in mature forest and avoid young regrowth, and in mallee-heath in Victoria they are more frequent in mature scrub not burnt for 60–80 years. Clearance of habitat and overgrazing by stock threatens Hall's Babbler, which is considered "vulnerable" in New South Wales. There is little information on potential threats to Chestnut-crowned Babblers, but the species is not considered to be at risk anywhere within its range.

New Guinea Babblers appear not to be facing any real threat in the New Guinea forests to which they are confined. Nevertheless, they are believed to vacate areas which are used frequently by humans, and they are probably sensitive to continued human presence in forests.

In Australia, pomatostomids are sometimes killed by vehicles, and there are some instances of Grey-crowned Babblers being shot by humans in acts of vandalism. Feral cats are responsible for the deaths of some of these birds and can have detectable adverse effects on populations at a local level. In addition, some Australasian babblers are possibly killed by foxes (*Vulpes*).

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PLATE 27

inches 4  
cm 10

## Family POMATOSTOMIDAE (AUSTRALASIAN BABBLERS) SPECIES ACCOUNTS

### Genus *POMATOSTOMUS* Cabanis, 1851

#### 1. New Guinea Babbler

##### *Pomatostomus isidorei*

French: Pomatorhine isidore

German: Beutelsäbler

Spanish: Gárrulo Papú

Other common names: Rufous Babbler(!), Isidore's Rufous Babbler

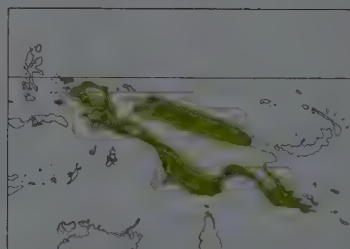
**Taxonomy.** *Pomatorhinus isidorei* Lesson, 1827, Dorei Harbour = Manokwari, north-western New Guinea.

Sometimes placed in a separate genus, *Garritorhinus*, on basis mainly of yellow (not black) bill, rufous plumage coloration and distinctive pendent nest, and recent analyses suggest some possible genetic differences; further study required. Precise distributions of races uncertain; details given below are tentative. Two subspecies recognized.

##### **Subspecies and Distribution.**

*P. i. isidorei* (Lesson, 1827) – West Papuan Is (Waigeo, Misool) and lowland New Guinea except N. *P. i. calidus* (Rothschild, 1931) – N New Guinea E to Astrolabe Bay.

**Descriptive notes.** 25 cm; 30–47 g. Medium-sized pomatostomid with mainly rufous plumage, broad tail and yellowish bill. Has top of head, upperparts and upperwing olive-brown to rufous-brown, tail rich rufous; chin, throat, ear-coverts and upper breast orange-buff, paler than rest of plumage (and forming diffuse pale facial mask), grading to darker rufous on lower breast, flanks, belly and undertail-coverts; underwing-coverts and axillaries rufous-brown; iris light brown or dull yellow; bill orange-yellow, dusky base to upper mandible; legs dark grey. Sexes similar. Juvenile is poorly described, similar to adult but iris darker brown, crown more olive (less rufous); immature probably difficult to distinguish from adult, but iris said to be dark brown and tone of



upperparts shows patchy variation. Racial differences slight. Voice. Low, hoarse, descending slurred “work” or “whaak” in contact; also repeated “phew” whistle as contact, said to resemble call of Rusty Pitohui (*Pitohui ferrugineus*) and possibly mimicry of that species; when excited, groups give loud, deep, rolling “whu whu whui”; loud “hu-wick” or “who who whi wick” when alarmed and just before flying away.

**Habitat.** Monsoon forest, rainforest, more mature secondary growth and lowland gallery forest; forages also in disturbed habitats and teak (*Tectona*) plantations. Foothills to at least

300 m, probably to c. 500 m.

**Food and Feeding.** Poorly known. Probably mainly insects, including crickets (Orthoptera), beetles (Coleoptera) and termites (of family Termitidae); some spiders (Araneae) and small reptiles also taken. Larger prey held down with one foot and eaten in pieces. Forages mainly in low undergrowth, sometimes on the ground or in lower canopy of forest; typically moves upwards through tree. Gleans and probes with bill through leaf litter, in crevices and in masses of dead leaves under branches. Known to drink water in dry weather conditions. Typically forages in groups of 4–10 birds, sometimes in mixed-species flocks with Spangled Drongos (*Dicrurus bracteatus*) and Rusty Pitohuis.

**Breeding.** Recorded in wet season and middle of dry season. Little information on breeding system, but co-operative breeding recorded; probably one pair sexually active, and assisted in nest-building and brood-feeding by helpers. Nest an untidy large flask-shaped pendent structure 1–2 m long, roofed porch at side entrance, internal chamber c. 30 cm wide, and with dangling “tail” c. 50 cm long; comprises long dried stems of creepers and vines and dried fibres, lined with strips of *Pandanus* and other palms and with bamboo leaves; typically placed in vertical vine or creeper.

often lawyer-vine (*Calamus*), and hanging 3–9 m above ground in forest clearing; often several nests within a few metres of each other. No other information.

**Movements.** Poorly understood. Apparently roams across group territories.

**Status and Conservation.** Not globally threatened. Fairly common. Apparently absent from some areas where habitat suitable, but this possibly due to oversight. Population density estimated at 1–6 birds/ha; home ranges of groups estimated at 4 ha in size.

**Bibliography.** Beehler *et al.* (1986), Bell (1982a, 1983), Coates (1990), Coates & Peckover (2001), Hartert *et al.* (1936), Mayr & Rand (1937), Rand & Gilliard (1967), Rothschild (1931).

## 2. Grey-crowned Babbler

### *Pomatostomus temporalis*

**French:** Pomatostome à calotte grise **German:** Grauscheitelsäbler **Spanish:** Gárrulo Coronigris  
**Other common names:** Grey-crowned Chatterer; Red-breasted/Rufous-breasted Babbler (*rubeculus*)

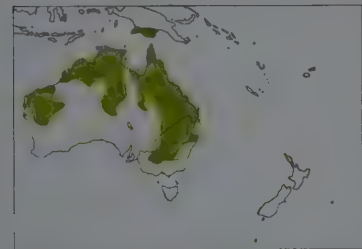
**Taxonomy.** [*Pomatorhinus*] *Temporalis* Vigors and Horsfield, 1827, Shoalwater Bay, Queensland, Australia.

Races sometimes considered to represent two separate species, and possibly genetically divergent, but apparently intergrade in W Queensland; further study required. Geographical variation largely clinal, size becoming larger and plumage grayer from W to N & E, and a dozen races sometimes recognized; described races considered untenable are *streptitans* (lowland S New Guinea from Princess Marianne Strait E to R Oriomo) and, in Australia, *nigrescens* (Western Australia from Pilbara area S to upper R Murchison and Wiluna), *intermedius* (from Kimberley, in Western Australia, E to arid interior Queensland and N South Australia), *bamba* (Melville I, off NW Northern Territory), *brownei* (Cape Arnhem Peninsula, in N Northern Territory), *mounfordae* (Groote Eylandt), *cornwalli* (coastal NE Queensland S to Cairns), *trivirgatus* (coasts of S Queensland and New South Wales), *tregellasi* (SE South Australia E to SE New South Wales). Two subspecies currently recognized.

#### **Subspecies and Distribution.**

*P. t. temporalis* (Vigors & Horsfield, 1827) – S New Guinea (Trans-Fly region) and E Australia.

*P. t. rubeculus* (Gould, 1840) – NW, N & C Australia.



**Descriptive notes.** 23–27 cm; 60–85 g. Distinctive large pomatostomid with broad supercilium, white or rufous breast, and prominent rufous patch on wing (concealed when wing closed). Nominant race has narrow grey stripe down centre of crown and nape and broadening on hindneck, very broad white supercilium (can give appearance of white cap), blackish-brown mask extending from bill through eye to ear-coverts and side of neck; upperparts mostly grey, grading to dark brown on rump and uppertail-coverts; lesser and median upperwing-coverts grey-brown, greater coverts, primaries and secondaries dark brown,

prominent rufous patch across primaries (visible in flight); tail blackish-brown, feathers with white tips which broadest on outer rectrices (and obvious in flight); chin, throat and upper breast white, grading to brownish-grey on breast side, to rufous-brown on flanks and upper belly, and to dark brown on rest of underbody; underwing-coverts and axillaries light greyish-brown; iris pale yellow; bill black, narrow pinkish strip along lower mandible and along base of culmen; legs dark grey. Sexes similar. Juvenile is similar to adult, but bill shorter and less decurved, iris dark brown, gape yellowish, ear-coverts paler, and has narrow rufous tips on upperwing-coverts and alula; immature identical to adult in plumage, but iris browner (not pure yellow until at least 3 years old). Race *rubeculus* differs from nominate mainly in slightly darker brown upperparts and upperwing, and rufous breast. Voice. Various harsh chattering contact notes; distinctive “ya-hoo” antiphonal duet by breeding male and female.

**Habitat.** Open native forests and woodlands, typically dominated by mature gums or ironbarks (*Eucalyptus*), cypress pine (*Callitris*) or belah (*Casuarina*) and with plentiful leaf litter and open grassy understorey; in N Australia and S New Guinea also in savanna, monsoon forest, paperbark (*Melaleuca*) thickets and *Acacia* shrublands. Often along watercourses, and occasionally in remnant native vegetation along road edges or on farmland.

**Food and Feeding.** Mainly insects, including weevils (Curculionidae) and other beetles (Coleoptera), grasshoppers (Orthoptera), bugs (Hemiptera), butterfly larvae (Lepidoptera), termites (Termitidae) and ants (Formicidae); also seeds, spiders (Araneae), scorpions (Scorpiones), and even small reptiles and the nestlings of small birds. Forages on ground, and in low shrubs or trees, often turning leaves and small stones with bill. Often probes among bark and fallen timber. Usually in groups of 2–15.

**Breeding.** Recorded in Dec and Feb in New Guinea and in all months, but mainly Jul–Feb, in Australia. Breeds co-operatively, in groups comprising monogamous breeding pair and varying number of helpers, which often siblings or offspring of pair. Nest used for breeding and roosting, constructed by all or most members of group, a large dome, often with “spout” on one side, made of sticks, grass, rootlets and bark, lined with finer materials including wool, feathers, soft grass and leaf litter; placed 1–15 m above ground, usually in small tree (often of genus *Eucalyptus*, *Callitris* or *Acacia*) and typically supported by fork or upright branch; home range of group 1.5–50 ha. Clutch 2–6 eggs, average 3; incubation usually by female parent alone, period 21–25 days; chicks fed by all or most members of group, fledging period 17–23 days. Hatching success c. 65%, fledging success c. 20–50%.

**Movements.** Sedentary, but some evidence for local movements or nomadism. Almost all recoveries are from within 10 km of site of ringing.

**Status and Conservation.** Not globally threatened. Fairly common to scarce. Estimated population densities 0.08–0.6 birds/ha; in SE Queensland, 33 groups recorded in c. 1350 ha. Nominant race considered “threatened”: has declined, particularly in S parts of range, owing mainly to habitat fragmentation and changes in fire regimes; disappeared from several areas in S Victoria and South Australia. Cats and foxes (*Vulpes*) known to kill birds of this species, and feral pigs probably damage habitat.

**Bibliography.** Adam & Robinson (1996), Andrew & Rogers (1993), Barrett *et al.* (2003), Beehler *et al.* (1986), Blakers *et al.* (1984), Brown & Brown (1981), Brown *et al.* (1983), Coates (1990), Counsilman (1977, 1979, 1980), Cowles (1974), Davidson & Robinson (1992), Dow & Gill (1984), Dow & King (1984), Edwards (1993), Edwards

& Kot (1995), Edwards & Wilson (1990), Gill & Dow (1983, 1985), Higgins & Peter (2002), Johnstone (1983), Johnstone & Storr (2004), King (1980), Lockwood & Robinson (1997), McCarthy (2006), Robinson (1994), Robinson *et al.* (1997, 2006), Schulz (1991).

## 3. White-browed Babbler

### *Pomatostomus superciliosus*

**French:** Pomatostome bridé **German:** Brauensäbler **Spanish:** Gárrulo Cejudo  
**Other common names:** White-browed Chatterer

**Taxonomy.** [*Pomatorhinus*] *Superciliosus* Vigors and Horsfield, 1827, Yorke Peninsula, South Australia.

Geographical variation slight and perhaps to some extent clinal, and races intergrade; validity of races questioned, some authors considering differences due largely to degree of plumage wear; further study required. Birds from Gascoyne valley (W Western Australia) sometimes separated as *gwendoleneae*, but appears indistinguishable from nominate and *ashbyi*. Four subspecies currently recognized.

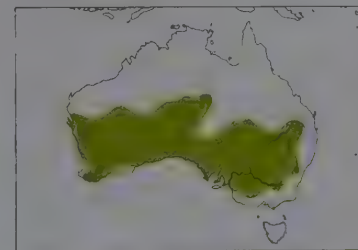
#### **Subspecies and Distribution.**

*P. s. superciliosus* (Vigors & Horsfield, 1827) – CW Western Australia E to South Australia and W Victoria.

*P. s. ashbyi* Mathews, 1911 – SW Western Australia.

*P. s. centralis* Schodde & Mason, 1999 – C Australia (S Northern Territory, N South Australia).

*P. s. gilgandra* (Mathews, 1912) – inland SE Australia (S Queensland S to C Victoria and EC New South Wales).



**Descriptive notes.** 17–22 cm; 30–50 g. Small, dull brown pomatostomid with comparatively narrow white supercilium, mainly white underbody. Nominant race has top of head dark brown, fairly narrow, long white supercilium from side of forehead to side of neck, bordered narrowly above and below with uneven black lines; broad blackish eyestripe extending across lores and ear-coverts, grading to grey-brown on neck side; upperparts mostly brown or greyish-brown, grading to dark brown on uppertail-coverts; upperwing dark brown, coverts with light greyish fringes; tail blackish-brown, white tips of feathers broadest on outer rectrices (and

obvious in flight); chin, throat and centre of breast and belly white, grading to grey-brown on flanks and sides of breast and belly, and to dark brown on under tail-coverts, latter with whitish scaling; underwing-coverts and axillaries light rufous-brown; iris dark brown; bill black, narrow whitish or pale bluish strip along base of lower mandible; legs grey-black. Sexes similar. Juvenile is very like adult, but bill shorter and less decurved and lacks pale line, gape yellow, and greater secondary upperwing-coverts, primary coverts and tertials have narrow light rufous edges; immature probably indistinguishable from adult in field. Races vary slightly in darkness and tone of upperparts and width of white tail tips: *ashbyi* is slightly larger and subtly paler than nominate; *centralis* is slightly smaller and darker than nominate; *gilgandra* is very like nominate and previous but has slightly longer tail, plumage very marginally darker than nominate, white tail tips usually broader. Voice. Various chattering, bubbling and whistling notes, and loud cat-like calls sometimes given.

**Habitat.** Open native forests, woodlands and shrublands, typically with dense understorey dominated by *Acacia*, *Cassia*, *Banksia* and other shrubs; often recorded in mallee (*Eucalyptus*) shrublands and woodlands, and sometimes in shrubby heathland communities. Occasionally occurs in roadside vegetation or in open areas such as agricultural land and golf courses.

**Food and Feeding.** Mainly insects, including cockroaches (Blattodea), beetles (Coleoptera), grasshoppers (Orthoptera), bugs (Hemiptera), wasps (Hymenoptera), butterfly larvae (Lepidoptera) and ants (Formicidae); also seeds, fruits, spiders (Araneae), and eggs or nestlings of small birds such as House Sparrow (*Passer domesticus*). Forages mainly on ground, but also in low shrubs or trees. Often probes among crevices, bark and fallen timber or leaf litter. Occasionally drinks water. Usually in groups of up to 15 individuals.

**Breeding.** Recorded in all months, but mainly Jul–Nov. Breeds co-operatively in groups, with up to six helpers, but nature of bonds not fully understood; some groups have more than one breeding pair. Nests used for breeding and roosting, brood-nests typically built by breeding female, roosting nests built by all members of groups; a large dome, often with hooded or spout-like entrance near top, made of long sticks and lined with grass, bark, wool, feathers, plant down and leaf litter, placed 0.5–6 m above ground, usually in shrub or small tree (often *Eucalyptus*, *Grevillea*, *Callitris* or *Acacia*) and typically supported by fork or interlocking branches; home range of group 1.5–15 ha. Clutch 1–6 eggs, usually 2–4; incubation by female parent, period 19–20 days; chicks fed by both parents and by helpers, fledging period 16–17 days; fledglings fed by all members of group. Nest parasitism by Pallid Cuckoo (*Cuculus pallidus*) and Black-eared Cuckoo (*Chrysococcyx osculans*) recorded. Hatching success c. 31%, fledging success c. 16%. Annual survival rate estimated at 83% in Victoria, and at least 66% for adults in Western Australia (Peron Peninsula).

**Movements.** Mainly sedentary, but some evidence for local movements or nomadism in parts of range. Almost all recoveries are from within 10 km of site of ringing.

**Status and Conservation.** Not globally threatened. Locally common to scarce. Population densities estimated at 0.1–1.6 birds/ha; at least 11 breeding groups within 55 ha on Peron Peninsula, in Western Australia. Has declined in some parts of S range, this due mainly to urbanization, habitat fragmentation and changes in fire regimes; disappeared from several areas in S Victoria and South Australia. Populations in cereal-production areas of SW Western Australia considered “threatened”. Killed by cats in some area.

**Bibliography.** Andrew & Rogers (1993), Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker, B. (198b), Brooker, M.G. (1989), Cale (1999, 2002a, 2002b, 2003), Carter (1924a), Cowles (1974), Garnett & Crowley (2000), Goodwin (1967), Higgins & Peter (2002), Howe (1909), Johnstone & Storr (2004), McCarthy (2006), Schodde & Mason (1999), Woinarski (1989a), Wooller & Calver (1981), Wooller & Richardson (1986).

## 4. Hall’s Babbler

### *Pomatostomus halli*

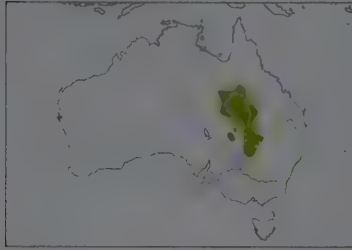
**French:** Pomatostome de Hall **German:** Rußbauchsäbler **Spanish:** Gárrulo de Hall



**Other common names:** Black-bellied/Dark-bellied/White-breasted/White-throated Babbler

**Taxonomy.** *Pomatostomus halli* Cowles, 1964, Tyrone Station, south-western Queensland, Australia. Monotypic.

**Distribution.** Inland E Australia from SW Queensland (S of Finucane Range, E to Forsyth Range) S to NW New South Wales.



**Descriptive notes.** 19–21 cm; 30–47 g. Medium-sized, dark pomatostomid with broad white supercilium and distinct white bib. Has top of head from centre of forehead to nape and hindneck dark brown, broad whitish supercilium extending from side of forehead to side of nape (can give appearance of white cap), broad blackish eyestripe across lores and through eye to ear-coverts, and grading into dark brown on side of neck; upperparts, including upperwing, dark brown; tail blackish-brown, white tips of feathers broadest on outer rectrices (and obvious in flight); chin, throat and centre of upper breast white, sharply demarcated from dark brown lower underbody; underwing-coverts and axillaries dark brown; iris dark brownish; bill black, narrow whitish strip along base of lower mandible; legs black. Sexes similar. Juvenile resembles adult, but bill shorter and less decurved, gape yellow, primary upperwing-coverts narrowly edged yellowish-brown; immature probably difficult to distinguish from adult. Voice. Noisy sharp chirping and buzzing calls, as well as strident staccato, whistling and scolding notes.

**Habitat.** Open tall mulga (*Acacia*) woodlands and shrublands, often in stony gulleys or on stony plains or slopes; recorded also in mixed woodland of mulga, cypress pine (*Callitris*) and eucalypt (*Eucalyptus*). Areas with more than 70% tree cover (7–11 m tall) and sparse shrub understorey preferred. Occurs rarely in grassland with sparse tree or shrub cover.

**Food and Feeding.** Poorly known. Eats insects, including beetles (Coleoptera) and butterfly larvae (Lepidoptera). Forages on ground, also in shrubs and from branches and trunks of trees. Often probes among crevices and in bark; turns over stones and wood in search of food. Usually in groups of 5–15 individuals.

**Breeding.** Recorded in most months. Breeds co-operatively, in groups comprising breeding pair and one or two helpers. Groups known to build multiple nests, but only one used for breeding at any one time; nest a fairly compact dome, with outer chamber made of sticks, inner chamber lined with grass, feathers and hair, placed 3–8 m above ground and usually in mulga tree; estimated size of group home range 2–18 ha. Clutch size poorly known, thought to be c. 2 eggs; no information on incubation period; helpers assist with feeding of nestlings, fledging period probably more than 10 days. No other information.

**Movements.** Poorly understood; probably sedentary and territorial. All ringing recoveries are from within 10 km of site of ringing.

**Status and Conservation.** Not globally threatened. Locally fairly common. Clearance and grazing of habitat are probably the main threatening processes.

**Bibliography.** Andrew & Rogers (1993), Balda & Brown (1977), Barrett *et al.* (2003), Blakers *et al.* (1984), Brown & Balda (1977), Cowles (1964, 1974), Dow (1983), Ford (1977), Gill & Dow (1983), Higgins & Peter (2002), Horton (1973), McCarthy (2006), Miura & Edwards (2001).

## 5. Chestnut-crowned Babbler

### *Pomatostomus ruficeps*

**French:** Pomatostome à calotte marron

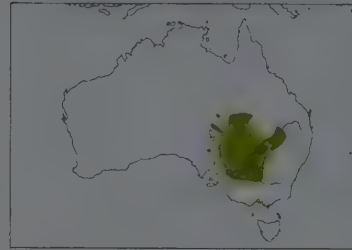
**Spanish:** Gárrulo Coronirrufo

**German:** Rotscheitelsäbler

**Other common names:** Red-capped/Rufous-crowned Babbler, Chestnut-crowned Chatterer

**Taxonomy.** *P[omatostomus] ruficeps* Hartlaub, 1852, Adelaide, South Australia; error = Broken Hill District, New South Wales, Australia. Monotypic.

**Distribution.** Inland SE Australia from SW Queensland and NE South Australia S to W New South Wales and extreme NW Victoria.



**Descriptive notes.** 19–23 cm; 50–60 g. Medium-sized pomatostomid with chestnut cap, narrow white supercilium, large white bib and diagnostic white wingbars. Has forehead to hindneck chestnut, narrow whitish supercilium from side of forehead to nape side narrowly bordered above and below by uneven black lines; broad blackish eyestripe across lores and through eye to ear-coverts, grading to brown on side of neck; upperparts brown with faint greyish mottling or scaling, upperwing brown, greater and median secondary coverts with distinct white tips forming pair of wingbars (obvious both in flight and when perched); tail

blackish-brown, white tips of feathers broadest on outer rectrices (and obvious in flight); chin, throat, most of breast and centre of belly white, sharply demarcated from grey-brown flanks and sides of breast and belly, grading to dark grey-brown on undertail-coverts, latter with white scaling; underwing-coverts and axillaries rufous; iris dark brown; bill black, narrow whitish or pale bluish strip along base of lower mandible; legs grey-black. Sexes similar. Juvenile differs from adult in having cap duller chestnut, supercilium washed rufous, chin and throat dull cream, bill shorter and less decurved and without pale line, gape yellowish, wingbars duller and light rufous, also narrow rufous fringes on alula, primary coverts and tertials; immature difficult to distinguish from adult, but retains varying number of rufous-fringed juvenile upperwing feathers. Voice. Noisy sharp chattering and plaintive whistling notes, described as sharper or harsher than those of *P. superciliosus*.

**Habitat.** Open arid and semi-arid woodlands and shrublands, often along watercourses and on sand plains. Occurs in open tall mallee eucalypt (*Eucalyptus*) woodland with open shrub understorey of *Acacia* and *Cassia*; often recorded in open chenopod shrubland, mainly bluebush (*Maireana*) and saltbush (*Rhagodia*, *Atriplex*). Also in open sugarwood (*Myoporum platycarpum*) woodland, and occasionally in riparian woodland dominated by coolibah (*Eucalyptus microtheca*) or river red gum (*Eucalyptus camaldulensis*).

**Food and Feeding.** Eats mainly insects, including beetles (Coleoptera), butterfly larvae (Lepidoptera), termites (of family Termitidae) and ants (Formicidae); also seeds and fruits of chenopods and mistletoes (Loranthaceae). Forages mainly on ground, also in low shrubs or trees. Often probes among crevices, bark and fallen timber, and digs in soil. Usually in groups of 4–6 individuals, but feeding flocks of up to 30 birds recorded.

**Breeding.** Recorded Jun–Dec, mainly Sept. Breeds co-operatively in groups, but nature of bonds not understood, and little known about social organization. Groups known to build multiple breeding and roosting nests; nest a large deep, bulky dome (larger than that of Australian congeners), with slightly hooded entrance at side and sometimes comprising two chambers, made of sticks, grass, dung and other materials, and lined variously with grass, bark, wool, feathers, plant down and reptile skin; placed 3–10 m above ground, usually in shrub or tree, often eucalypt, cypress pine (*Callitris*), *Casuarina*, bullock-bush (*Alectryon*) or mulga (*Acacia*), typically supported by several small forks. Clutch 3–5 eggs, usually 4; no information on duration of incubation and fledging periods, and little known about parental duties, but young fed by both parents and helpers. Annual survival rate estimated at 66%.

**Movements.** Poorly understood; probably sedentary and territorial. All ringing recoveries are from within 10 km of initial ringing site.

**Status and Conservation.** Not globally threatened. Locally common to fairly common; scarce in some parts of range.

**Bibliography.** Andrew & Rogers (1993), Ashby (1918), Barrett *et al.* (2003), Blakers *et al.* (1984), Boehm (1949, 1974), Chandler (1939), Cowles (1974), Higgins & Peter (2002), Joseph (1986), Kuss (1933), McGilp (1923, 1943), Morris *et al.* (1981), Smith (1992).





Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family ORTHONYCHIDAE**  
**(LOGRUNNERS)**



- Medium-sized, stocky passerines with powerful legs and well-developed claws, short bill with terminal maxillary notches, rounded wings, and rather short tail with stiffened shafts protruding beyond ends of feathers; plumage a complex combination of brown, rufous, black, grey and white, one species unpatterned black above and white on lower breast and belly.
- 18–29 cm.



- Australia and New Guinea.
- Rainforest.
- 1 genus, 3 species, 6 taxa.
- No species threatened; none extinct since 1600.

### Systematics

The taxonomic placement of the logrunners has long been problematic. In the nineteenth century, these unusual birds were included in the "Crateropodes", a grouping of stout-legged, mostly terrestrial forms, which also included species now placed in several other, sometimes unrelated, families. A connection with the lyrebirds (Menuridae) was suggested because of similarities in terrestrial habits, nest construction, clutch size and breeding season. More traditionally, however, logrunners have been included with other ground-frequenting passerines of the Australian and New Guinean region in a heterogeneous assemblage the constituent clusters of which had little in common other than primarily terrestrial habits and strongly developed legs. The oldest applicable name for this group is Orthonychidae. This was sometimes maintained as a subfamily within a greatly enlarged Muscicapidae, where it was placed near the thrushes (Turdidae) and the babblers (Timaliidae), but later it was accorded full family status. The DNA-DNA hybridization studies undertaken in the 1980s and 1990s indicated, however, that logrunners were quite distinct from these and other passerine families, and worthy of family-level recognition on their own. For the remaining species hitherto included with them in the same family, the name Eupetidae is applicable.

An outcome of these and subsequent DNA analyses was the identification of Orthonychidae as part of the great, near-endemic Australo-Papuan passeriform radiation, the "parvorder Corvida". More specifically, it was placed in the superfamily Corvoidea but outside the core group, which includes the Corvidae and close relatives. Orthonychidae is now recognized as one of the more basal members of this superfamily.

There are three living species, although the species-level distinction of one of these has been confirmed only recently. Two species, the Australian Logrunner (*Orthonyx temminckii*) of central eastern Australia and the New Guinean Logrunner (*Orthonyx novaeguineae*) of the high ranges of New Guinea, have the proportions of moderate-sized thrushes, being up to 21 cm long and up to 75 g in weight. The third, the Chowchilla (*Orthonyx spaldingii*) of north-eastern Australia, is a markedly larger bird, up to 29 cm and 215 g. When first described, the New Guinea form was considered a distinct species, a treatment maintained for some years, and this population has on occasion even been placed in its own subgenus, *Papuorthonyx*. Eventually, however,

it was merged with the Australian Logrunner, with which it shares similarities in size and plumage. The treatment of these two widely separate populations as representing a single species served to emphasize the unusual distribution of this family. Under these traditional species limits, the Australian Logrunner "leap-frogs" the larger, darker Chowchilla, and reappears in the central ranges of New Guinea. This disjunct, seemingly anomalous pattern attracted much attention, particularly as it was mirrored by the two sooty-owls, the Greater Sooty-owl (*Tyto tenebricosa*) and the Lesser Sooty-owl (*Tyto multipunctata*). In this case, the larger, darker *tenebricosa* is the south-eastern Australian and New Guinean form, while the smaller, paler *multipunctata* occurs in north-eastern Australia.

Recent field observations have demonstrated that the logrunners in New Guinea are very different vocally from those in south-eastern Australia. Furthermore, DNA-sequencing has now revealed that the two populations are genetically quite distinct. Despite their similarities, and their differences from the Chowchilla in these same characters, the south-east Australian and the New Guinea forms are not necessarily each other's closest relatives. The shared plumage of these northernmost and southernmost populations appears to be the ancestral state for this genus. The DNA results suggest that the Chowchilla and the New Guinean Logrunner are more closely related to each other, as sister-species, than either is to the Australian Logrunner.

That was not, however, the only unexpected conclusion from this study. The degree of genetic divergence between the Australian and New Guinean Logrunners is about 20%, a magnitude that in many other instances is associated with divergence at the genus level. Moreover, although it is difficult confidently to assign some New Guinea individuals to subspecies without knowledge of their localities, these disjunct populations have levels of genetic divergence in the range demonstrated by distinct species. The difference between the Vogelkop subspecies and the other two, both inhabiting the central cordillera, is particularly marked. These results are indicative of long-standing isolation in this archaic lineage. In contrast, the two subspecies of the Chowchilla present minor genetic differences. Phenotypically, these two differ in the intensity of colour tone of the plumage and little else, and their separation is undoubtedly of much more recent origin.

The findings for *Orthonyx* are in striking contrast to those for the two sooty-owls. Despite their apparent analogous distribu-

tion patterns, the owls exhibit what seem to be only low levels of genetic differentiation among all populations, and it is doubtful whether recognition of more than one species can be justified. The congruent distributions of logrunners and sooty-owls have evidently resulted from very different evolutionary histories.

This basal position of Orthonychidae, and its lack of close relatives within the Corvida parvorder, indicate that these birds comprise one of the older groups of oscine songbirds. They also have one of the oldest fossil records of any passerine family. This record is also one of the richest, with three named species: *Orthonyx kaldowinyeri*, from the Middle Miocene of northern Australia, and *O. wakefieldi* and *O. hypsilophus*, from Quaternary cave deposits in south-eastern Australia. The last two are, respectively, the smallest and the largest species in the genus.

Finally, it is worth mentioning the English vernacular names of the three extant members of the family, as these have some relevance to the systematics of these species. The older names of "Spine-tail" or "Spine-tailed Logrunner" for *O. temminckii* draw attention to the species' most curious physical feature, the stiffened, protruding shafts of the tail feathers. Another colloquial name, "Scrubquail", was derived from its terrestrial habits and the fact that, when startled, its flight resembles that of a quail (*Coturnix*). None of the more recent English names given to these birds is entirely appropriate. "Southern Logrunner" and "Northern Logrunner" for *O. temminckii* and *O. spaldingii*, respectively, had extensive currency, even when the former species was considered to include the New Guinea populations. As *O. spaldingii* has smaller relatives both to the south and to the north, the name "Northern Logrunner" was more parochial than it was apt. The names of both Australian species were eventually deemed inappropriate, and that of *O. temminckii* was shortened to "Logrunner", while *O. spaldingii* became the "Chowchilla", a transliteration of its distinctive call. With the recent splitting of the former into two species, it seems fitting to qualify the names, adding the epithet "Australian" for *O. temminckii* and "New Guinean" for *O. novaeguineae*.

Although the present nomenclature is far from ideal, since it obscures the fact that the three species are closely related members of the same genus, the name "Chowchilla" is retained for *O. spaldingii* in accordance with current usage. The general name "logrunner" is used collectively for all the species of this family.

### Morphological Aspects

Logrunners are stocky birds, all three being similar in build, despite the differences in size amongst them. All have powerful legs and well-developed claws; in reference to the latter, incidentally, the generic name, *Orthonyx*, means "straight claw". The

Chowchilla and the Australian Logrunner have scutellate tarsi, whereas the tarsus of the New Guinean Logrunner is booted, one of the characters on which it was earlier segregated at species, and even genus, level. The unspecialized bill is of moderate strength; it is short, with slit-operculate nostrils, and possesses terminal maxillary notches for pecking and grasping invertebrate prey exposed on the forest floor. The rounded wings have ten primaries, with primary P6 the longest, followed by P7 and P5, which are subequal; there are nine secondaries, including three tertials. Perhaps the most curious physical feature of these birds is the stiffened shafts of the ten tail feathers, the tips of which protrude beyond the ends of the feathers as pliable spines up to 7 mm in length.

The plumage is dense but somewhat lax. Several authors have noted the prominence of feather lice (Mallophaga) usually carried by these birds. The plumage patterns of the Australian and New Guinean Logrunners are complex combinations of brown, rufous, black, grey and white. The crown and rump are rufous with faint darker scallop markings. The remaining upperparts are rufous-brown, the feathers having black edges and pale shaft streaks conferring a mottled appearance. The lower breast and belly are largely grey and white. On the upperwing, the secondary coverts have pale grey tips, which form prominent bars on the folded wing; spots on the leading edges of the primaries combine to form a third, light buff bar. The similarities in these patterns between the two species are a major reason why they were for long considered conspecific. There are, however, constant differences between the two. Logrunners in New Guinea are smaller and more melanistic; in particular, the upperparts are darker, with broader black edging on the feathers of the mantle and upper back, and the underparts are much greyer, this colour stretching extensively from the sides inwards towards the mid-line of the breast. In contrast to its two congeners, the Chowchilla is simply coloured, being unpatterned black over the upperparts and wings and white on the lower breast and belly; the eye is emphasized against the dark face by an orbital ring of pale blue skin.

All three members of the family have similar patterns of sexual dimorphism. The males have a white throat and upper breast, whereas the females have these areas of a rusty-orange colour. The Chowchilla is also sexually dimorphic in size, with females about 25% lighter than males. The pattern of plumage coloration may seem to run counter to the generalization that, in dimorphic species, the male is the brighter of the pair. In the gloom of the forest floor, however, the white may be more easily seen than the female's "fallen-leaf" hue. This makes sense, for it is the female that performs most of the duties of breeding, and she, therefore, presumably needs to be more cryptically coloured.

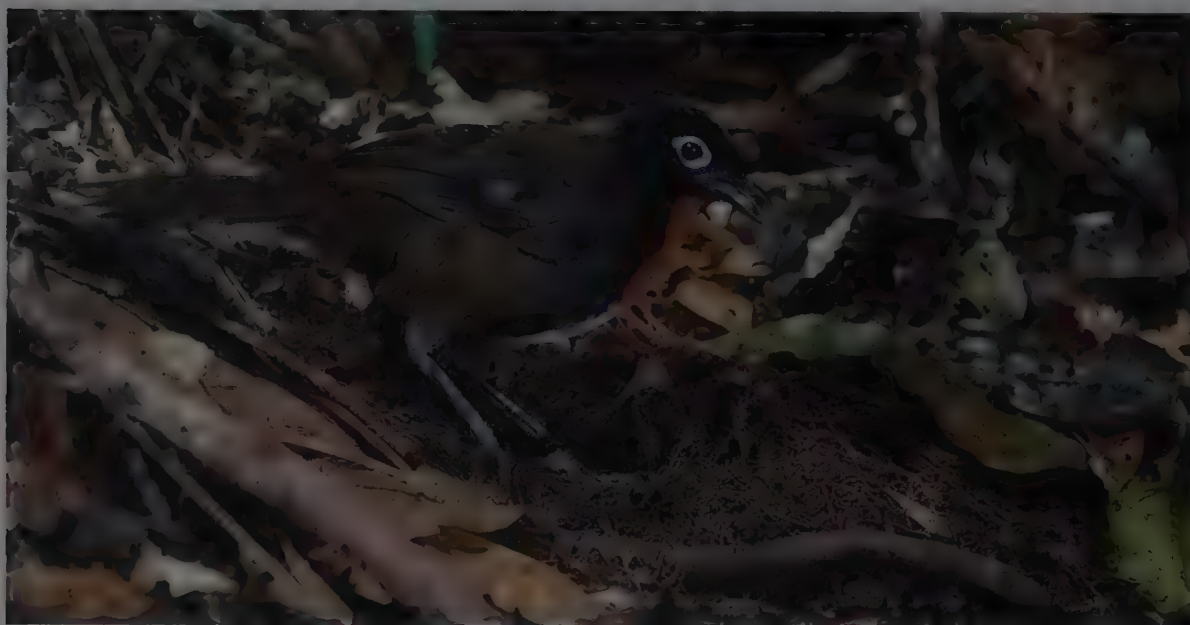
Juveniles are streaky on the face and underparts, have buffy wingbars and have pale feather shafts in the rest of the plumage.

The logrunners are one of the oldest groups of oscine songbirds. Ground-dwelling forest birds, they are well adapted for a terrestrial lifestyle in dense habitats, having sturdy legs, oversized feet, and distinctly rounded wings. The **Australian Logrunner**, the best known member of the family, is strikingly patterned with brown, rufous, black, grey and white, a combination which offers some camouflage against the leaf litter.

[*Orthonyx temminckii*,  
Mt Glorious,  
SE Queensland, Australia.  
Photo: Brian J. Coates]







The tail feathers of orthonychids have stiffened shafts which protrude at the tips as spines. The bill is short, fairly robust, with slit-operculate nostrils, and a notched upper mandible for gripping invertebrate prey. The Chowchilla is so named because of its distinctive call. Were it not for this vocalization, given mainly in the dry season, the species would be highly inconspicuous. It is restricted to the shady understorey of the Queensland rainforests.

[*Orthonyx spaldingii*  
*spaldingii*,  
Paluma, N Queensland,  
Australia.  
Photo: Clifford &  
Dawn Frith]

They have a mottled breast but, during the incomplete post-juvenile moult, they acquire the throat and breast colour appropriate to their sex. Subsequent moults are complete.

The legs and feet of the Orthonychidae are well adapted for the particular mode of feeding adopted by these birds (see Food and Feeding). They are stout, the "ankles" flexible, with thickly developed scutes, the toes joined somewhat at the bases and the claws robust. Skeletal adaptations are strongly evident in the femur and pelvis. The femur is short and stout, with a distinctive hourglass shape bestowed by the expansion of the distal end as a brace and of the proximal end for muscle attachments required for lateral movement of the foot. Although the pelvis is much shortened and broadened, it is proportionally large and robust for the size of the bird. Expansion of the post-acetabular section gives the pelvis a triangular shape when viewed from a dorsal aspect. The pre-acetabular portion supports two broad facets for the enlarged *M. ilirotrochantericus caudalis*; this muscle, in turn, attaches to the enlarged trochanteric crest on the lateral side of the femur's proximal end, powering a sideways sweeping motion. In most passerines, the "wings" of the pre-acetabular pelvis are separated by a double crest bordering an intervening space. In the logrunners, these anterior wings fuse across the median section in a single crest, which closes over, but does not fill in, the underlying double crest. A further unusual condition is the orientation of the ischium and the pubis. These, as well as exhibiting substantial lateral divergence, extend farther ventrally than is usual among the passerines.

The reliance on the legs, more than on the wings, is evident in the development of each of these limbs. The wing is rather short: the length of the humerus, ulna and carpometacarpus combined is slightly more than 60% of that of the leg. The carpometacarpus is short, about half the length of either the humerus or the ulna, and is stout and somewhat curved on the minor metacarpal, states characteristic of passerines having reduced dependence on flight. In contrast, the legs are strongly developed, with both the tibiotarsus and the tarsometatarsus elongated. As other members of the Corvoidea, logrunners have a single humeral fossa, but, unlike the core assemblage of this superfamily, they retain a metacarpal process (protuberantia metacarpalis). The sternal keel is slightly reduced, which is also indicative of the reduced flight capability of these birds. The anterior process of the sternal keel, known as the manubrium, is directed more cranially than it is in many other passerines.

Logrunners have a rounded cranium on which the foramen magnum is oriented more ventrally than is the case with many other avian groups. The zygomatic and postorbital processes are small spikes, while the large, robust ectethmoid is strongly fused with the lateral surface of the nasal bone. The interorbital septum

has two large, roughly equal fenestrae. The palate is unusual among passerines. The nasal cavity is comparatively open, and the short, somewhat pointed vomer extends only a short distance into it, while the palatine bars are thin and situated far to the side, such that they run along the edge of the cavity. The palatines terminate posteriorly in short rounded projections, and their medial sections lie more dorsally, on the same level as the vomer. The maxillo-palatine processes are thin, weakly developed splints. The rostrum is not straight, having a slight hump towards the base, which sits in front of a trench containing the nasofrontal hinge. The nostril is perforate.

## Habitat

Logrunners are birds of the rainforest. The Australian Logrunner and, in higher-rainfall districts of its range, the Chowchilla inhabit tropical and subtropical rainforest of the lowlands. Elsewhere, particularly in the Atherton Tableland and adjacent ranges of north-eastern Queensland and in the mountains of New Guinea, logrunners occupy montane rainforest. In some areas, the Australian Logrunner readily ventures into contiguous habitats if the vegetation is sufficiently low and thick. This vegetation can include invasive, introduced plants, notably lantana (*Lantana*) and blackberry (*Rubus fruticosus*), as these provide the necessary requirements of a leaf-litter layer and low intensity of light. The three orthonychid species are almost exclusively denizens of the forest floor where there is a good accumulation of fallen debris. Here, they spend most of their time in foraging, although they will occasionally climb into very low vegetation in order to feed. The main occasions on which they move to higher levels are when sleeping or when nesting: they sometimes roost up to 6 m above the ground, and occasionally build the nest at up to about 3.5 m.

A Quaternary fossil form from south-eastern South Australia is from a period when, instead of rainforest, more dry-adapted woodland dominated by casuarina (*Casuarina*) occurred in the region. This has led to speculation that other dense vegetation may have provided the necessary habitat features. Nowadays, closed scrub of paperbark (*Melaleuca*) and tea-tree (*Leptospermum*) provides such requirements, and the former genus has been recorded in the area throughout the past 50,000 years. If this vegetation did, indeed, harbour a species of *Orthonyx*, then this avian genus was not so exclusively rainforest-adapted as is suggested by the habitat preferences of the three living species.

This family is restricted to Australia and New Guinea. The Australian Logrunner is distributed along coastal areas and adjacent ranges in appropriate habitat from south-eastern Queens-

land south to the vicinity of Sydney, in central eastern New South Wales, where a small, apparently isolated population has persisted immediately south of this metropolis. The Chowchilla is confined to the highland region of north-eastern Australia, particularly above 450 m, occasionally descending into adjacent lowlands. One subspecies of the latter occurs in the main block of the Atherton Tableland south to Paluma Range, near Townsville; the other is found in the coastal ranges north of the Daintree River, to Mount Amos and Mount Finnegan. Between these is an area of apparent intergradation between the two subspecies. Studies of fossil pollen indicate that, during drier periods, this intervening zone supported open woodland, creating a habitat barrier between populations of this species.

New Guinean Logrunners occur in highlands, mainly within an altitudinal zone of 1980–2840 m, but in places can be found above and below these limits. This preference for upper elevations results in isolated populations in the higher altitudes of the mountain ranges. There are subspecies in the mountains of the Vogelkop, in the Nassau and Oranje Ranges of eastern Irian Jaya, and in the Herzog Mountains and Wharton Range in the south-east. Many of the apparent breaks in the distribution are real, but others may merely reflect our poor knowledge of this rare species. The New Guinean Logrunner was for a long time thought to be absent from the highlands of central and east-central New Guinea. Recently, however, it was discovered at the Tari Gap, in the Southern Highlands Province. Perhaps other populations remain to be discovered.

Fossil records extend the distribution of this family, with species in the far south-east of Australia and in the far east-central part of northern Australia.

### General Habits

Throughout the year logrunners remain in small groups of up to eight individuals, three or four being the usual number. Larger groups are rare, but aggregates of 16 to more than 30 Chowchillas have been reported in the non-breeding season. Regular groups comprise both males and females, although not always in the same proportions; when unequal numbers are present, females predominate. All members of these groups forage together, and all contribute to the defence of the territory. Interestingly, group-members are not necessarily related to each other.

At night, logrunners roost in low, dense vegetation. After waking, for the first hour after dawn, and particularly before sunrise, they vocalize constantly, advertising ownership of their territory. A singing individual adopts a position with its head raised, the throat bulging, the wings slightly lowered and the tail spread.

Usually one male starts to call, and he is soon joined by the other group-members for about 10 minutes. Such choruses can be deafening at close range. Both sexes sing, and group-members vocalizing together may take successive turns in singing, merging their efforts to produce a sequence with almost no breaks. Then, over the next 10–15 minutes, they all settle down to feed. Around dusk, they indulge in a second, shorter bout of calling. For most of the intervening period, the birds do not vocalize and can be inconspicuous, although the sound of digging may reveal their presence during otherwise quiet periods. An exception to this general lack of vocalizations occurs during encounters with neighbours along a territorial border. Logrunners are vocal throughout the year, although the Chowchilla is less so during the wet season.

During territorial encounters, opposing males may take up positions about 20 cm apart, one on each side of a mutual boundary. The combatants sing back and forth at each other. The remaining members of each group stand back somewhat and add their voices. Such encounters may be brief, or they may be protracted for up to 30 minutes. Sometimes, they conclude after no more than vocal jousts. If this is not sufficient to resolve the conflict, chases and even physical aggression may ensue. These birds respond readily to the playback of taped calls, and there is a record of Australian Logrunners attacking a tape recorder situated on a birdwatcher's back.

In the case of Chowchillas, the territory, which is defended throughout the year, occupies an area of 0.33–1.24 ha. Foraging and other activities make take place outside the territory, in the larger home range, which covers 0.71–5.43 ha. This often overlaps those of neighbouring groups, but it does not overlap their core areas, defined as the section where 60% of activity takes place. Home-range size is positively correlated with group size. Groups shift the bulk of their foraging to different parts of the home range from one season to another.

Orthonychids can be quite shy. When startled, they quickly flee into cover, often giving a loud shriek, or an excited 'weet weet weet', repeated from shelter for some time thereafter. Alternatively, an Australian Logrunner may freeze, its plumage helping to conceal it against the mottled background. Chowchillas have been seen to hide under fallen debris, kicking leaves over the back for concealment. A museum collector described how an injured New Guinean Logrunner took cover beneath a log, under which was a series of underground tunnels with multiple entrances. As a point of interest, according to the local people of the Tamrau Mountains, in north-west New Guinea, the logrunners excavate the tunnels themselves, and use them in order to shelter from the rain. The situation of being suddenly startled is among the few occasions when orthonychids feel compelled to take to the wing, which they do with a quail-like flight on whirring wings.

**The Australian Logrunner** hunts invertebrates by digging. First, it removes larger obstacles by kicking sideways, then it scratches front-to-back using both feet together or alternately in sweeping arcs, to discard debris, often with the tail acting as a brace. Once the patch is clear enough, the logrunner scratches the soil in the manner of a domestic fowl, thereby creating distinctive circular patches in the leaf litter, often referred to as "platelets".

[*Orthonyx temminckii*.  
Left: Australia.  
Photo: Roland Seitre.



Right: Mt Glorious,  
SE Queensland, Australia.  
Photo: Brian J. Coates]







The logrunner nest is a large globular dome, roughly the shape and size of a football. It is built by the female from leaves, sticks, moss, ferns and other vegetation, the construction period lasting from two weeks to several months. Nests are usually placed on or just above the ground against stumps or tree trunks, or suspended in clumps of low vegetation. This nest of the **New Guinean Logrunner** appears to be typical in all respects. This individual belongs to ■ recently discovered southern population that has yet to be assigned to subspecies.

[*Orthonyx novaeguineae*, Tari Gap, Southern Highlands, Papua New Guinea. Photo: Clifford & Dawn Frith]

for 10–20 m, before reaching cover. At other times, logrunners can be remarkably tame, ignoring quiet observers while they search for food, and even walking across a person's feet while foraging. A human being, if cautious and very quiet, can frequently approach to within 2–3 m, and often to 1 m during periods when the birds are group-singing. Likewise, logrunners engaged in territorial disputes allow a close approach, seemingly oblivious to the presence of human observers.

All evidence indicates that logrunners are largely sedentary (see Movements).

## Voice

The voices of logrunners are loud and penetrating. The song of the Australian Logrunner is a high-pitched "kweek, be-kweek-kweek-kweek-kweek". New Guinean Logrunners, in contrast, utter ■ repetitive whistled song, "tee too too too too" and "tsee too tee tooo". The two taxa do not respond to playback of each other's vocalizations. These vocal differences provide further evidence for the separation of the two at the species level (see Systematics). The best-documented song, however, is that of the Chowchilla, which has been studied in considerable detail. Its loud, ringing song, written as "chow-chilla-chow-chow-chilla" or "chow-chook-chook chow-chook-chook", is the source of its English vernacular name. A number of other notes, consisting of chirring growls and clucks, are given as the birds feed. The Chowchilla has been reported as being a skilled mimic.

All three species have other notes, which are used as a means of maintaining contact between members when foraging. In addition, they utter a range of scolding and alarm notes.

It has been found that, within the Chowchilla's geographical distribution, there are ■ number of "dialect groups". A dialect is used over an area of 26–75 ha, this area encompassing a number of groups. Ten dialects were recorded in a 500-ha study area, and at least eleven family groups in a 50-ha plot shared a single dialect. While there are some sounds unique to ■ dialect, the vocalizations of all the groups share ■ number of major components. Somewhat more than 80% of these are one of four main types: ■ descending "chow" or "chew", a similar note with reduced frequency, ■ two-syllable "chew-ee", and warble-like sounds. Additional sounds common to all groups are "caw-caw-caw", used before and between bursts of the main song or when the group is disturbed, and "kak-kak-kak", given during the main song and with no apparent specific timing. The components are assembled into phrases, themselves arranged in a sequence that

is characteristic of a dialect, as well as varying in rhythm and pitch among groups. In ■ study carried out in the same area over a 15-year period, it was noted that some dialects gained syllables, and one dialect was apparently lost. There is also a geographical factor involved, the two subspecies of the Chowchilla differing in the structure of their vocalizations: the more northerly individuals have ■ more restricted frequency range than those in the south, and they lack one of the syllables present in the songs of the southern subspecies.

Australian Logrunners exhibit a peculiar vocal behaviour known as "Group Song". Several individuals, usually about equal numbers of males and females, face each other on low perches, 30–60 cm from the ground. Holding the head up, with the wings lowered and the tail spread, they call loudly, this often leading to chasing. The entire episode lasts for approximately 15 minutes. It usually occurs in the early morning and can take place at any time during the year, although it is most prominent in the early spring. The function of group song is not known.



A female **New Guinean Logrunner** feeds its brood with annelid worms. These worms probably make up a large proportion of the nestling diet, along with a range of other soft-bodied terrestrial invertebrates, particularly insect larvae. In the better known logrunners, most or all provisioning at the nest is undertaken by the female, the male contributing only after the nestlings have fledged. This seems likely to be the case in New Guinea, given that the local form is closely related to the Australian Logrunner (*Orthonyx temminckii*).

[*Orthonyx novaeguineae*, Tari Gap, Southern Highlands, Papua New Guinea. Photo: Clifford & Dawn Frith]



The female *Chowchilla* tends to lay a single egg. This she incubates for 25 days, spending around 46–58% of her time on the nest. The incubation phase is followed by another 22–27 days raising the nestling, apparently without assistance from the male. During this period females will perform complex distraction displays to lure predators from the nest, and remove faecal sacs produced by the nestling, as shown here. After the young bird has left the nest, both parents contribute to the provisioning.

[*Orthonyx spaldingii*  
*spaldingii*,  
Paluma, N Queensland,  
Australia.  
Photo: Clifford &  
Dawn Frith]



### Food and Feeding

The main foods of logrunners are small invertebrates, particularly insects, but molluscs, annelid worms, including leeches, and spiders (Araneae), millipedes (Diplopoda), centipedes (Chilopoda) and amphipods have also been recorded in the diet of orthonychids. The larger Chowchilla will also take the occasional frog or lizard. In addition, small fruits are eaten from time to time. Although there are observations of logrunners feeding in low vegetation less than 1 m above the ground, and on large boulders, stumps and logs, the members of this family are, in essence, birds of the forest floor. The name “logrunner” does, in fact, over-emphasize the use of logs as a foraging substrate. When foraging, these species hop and run like rodents over the ground, pausing here and there in order to scrape away litter and to scratch and peck for invertebrates before moving on. Chowchillas have been recorded as foraging for more than 98% of the time during the daylight period, from 07:00 to 17:00 hours. The purpose of the spine-tipped tail and the oddly shaped femur (see Morphological Aspects) becomes apparent when logrunners are watched as they forage.

These birds appear to choose deeper or damper patches of litter as foraging sites, particularly during drier periods. Once a logrunner has chosen a spot in which to forage, it begins to clear the leaf litter and larger objects, such as sticks and rocks. There are infrequent observations of an individual using the bill to shift items, but the common practice is to employ the legs alone for this task. In the first phase, both feet are used, either alternately or with several successive strokes of one leg. As one leg is used, the main support comes from the opposite leg, which is bent at the ankle, with the tarsus and toes pointing forwards. The active foot is brought forwards under the chin, and then rapidly drawn back and outwards in a sweeping arc of 90° or more. This motion is made possible by the expanded pelvic muscles with their large attachments on the expanded proximal end of the femur; the enlarged distal end serves as a brace for the supporting leg. The effect of the action is that of vigorously throwing leaves and humus to the side and rear of the bird, and at times a foraging logrunner may be half-hidden by the debris that it has disturbed. In the second phase, once the ground is cleared sufficiently to enable the logrunner to feed, the legs are used alternately to scratch the soil in a backward direction, in the manner of a domestic fowl, in order to uncover insects, larvae and other invertebrates. As one leg scratches, the opposite leg is flexed such that the tarsus lies flat on the ground, the heavy scutes providing some protection. At the same time, the tail is used as a supporting prop for

the body, its feather tips angled into the litter. Logrunners sometimes pivot around the tail.

Any food items disturbed when the leaves are pushed out of the way are eaten. Smaller ground-feeding birds, such as the Yellow-throated Scrubwren (*Sericornis citreogularis*) and the Eastern Whipbird (*Psophodes olivaceus*), sometimes attend foraging logrunners, picking up small invertebrates that are unearthed by the latter's scratching. The musky rat-kangaroo (*Hypsiprymnodon moschatus*), a small marsupial, likewise follows groups of feeding Chowchillas.

Logrunners, as they work, produce distinctive cleared rounded patches, often referred to as “platelets”, about 10–20 cm in diameter on the forest floor. A foraging individual spends a short time in scratching at the one spot, before moving on to another a short distance away. Over a period of time, often of relatively brief duration, orthonychids can have significant effects on the litter layer. In some areas, the foraging of Chowchillas can result in a complete turning-over of the litter every five weeks. While this increases the litter homogeneity and maintains evenness of tree-seedling distribution, it also has major, and often deleterious, effects on these seedlings. The mortality rates of seedlings can be high, up to about 65%, with most losses attributable to Chowchillas, and with much higher survival rates observed in patches where these birds were excluded.

### Breeding

The three members of the family appear to be similar in most aspects of their breeding biology, insofar as the relevant facts are known, with relatively minor variations related to geographical differences in habitat and climate. The Chowchilla has been extensively studied, and considerable anecdotal information on the Australian Logrunner is available. Nests of the New Guinean Logrunner have been reported only rarely, but this species' breeding biology appears to be consistent with that of its Australian relatives.

As well as being highly territorial throughout the year, these birds are monogamous and form pairs of extended, if not permanent, duration. Despite the fact that orthonychids usually live in small parties, breeding individuals receive little assistance from the other members of the group; there is a single published observation of a second adult male feeding a fledgling, but co-operative breeding in the usual sense does not occur among these species. The female alone is responsible for most of the nesting tasks until the time when the fledglings leave the nest: she builds the nest and undertakes all of the incubation of the eggs and the feeding of the



nestlings. The male's contribution through these periods is to feed her, a job which he performs also at other times of the year.

Unlike many Australian passerines, the Australian Logrunner concentrates much of its breeding effort in the winter months. Starting in about May, or even as early as March, when most bird species in the region have finished the rearing of broods, the nesting season continues through to August or, rarely, to as late as January. The Chowchilla may nest in any month of the year, with eggs present in May through to February, and the peak in egg-laying in July–December. This results in the young hatching during the wet season, when food is most abundant. The few breeding records of the New Guinean Logrunner are from the months of March and November. As a rule, Chowchillas rear only a single brood in a season. In the case of the Australian Logrunner, the protracted breeding season allows sufficient time for a second brood to be reared.

The nests of all three species are large globular domes, looking like much smaller versions of a lyrebird (Menuridae) nest. These roughly football-shaped constructions are built of leaves and leaf litter, sticks and twigs, moss, ferns and other vegetation. A side entrance at the base opens on to a platform of sticks and leaves that extends outwards up to 30 cm. The entrance extends as a corridor into the nest-chamber, which is lined with moss, grasses, fine rootlets, plant fibres and hair-like fungi. The roof reaches out beyond the entrance, serving to conceal it partially, as well as stopping rain from flooding the interior of the nest. The construction work, which may take from two weeks to several months, begins with a foundation of twigs and sticks that underlies the sides, back and front, but not the central base; at the front, it protrudes to form an entrance platform. The female adds two sides as an inverted arch. The sides and the back eventually meet at the top, where they are capped with dry leaves and moss, and extended forwards to project above the nest entrance.

Orthonychid nests are usually placed on the ground against a tree trunk or clump of vegetation or, less often, in low vines or on a sturdy object such as a stump or log, occasionally up to 1.2 m above the ground. The nest of the Chowchilla has the same shape as that of the smaller species, but it is considerably larger. It is placed above the ground more frequently than is the nest of the Australian Logrunner, being sited especially on the top of a tree-fern, even up to 3.5 m from the ground. Nests are often placed near the site used in the preceding season.

The eggs are white, oval in shape, and large for the size of the bird, that of the Chowchilla weighing the equivalent of 10–11% of the female mass. The clutch of the Australian Logrunner char-

acteristically comprises two eggs, and occasionally one or three, whereas that of the Chowchilla is normally one egg. Only a single egg was present in the two reported nests of the New Guinean Logrunner. The female Chowchilla incubates for 46–58% of the daylight hours. The female Australian Logrunner has been recorded as sitting for up to 75% of the day, in stints of an average duration of about 70 minutes, but ranging from a little more than six minutes to more than two hours. These sessions are interrupted by breaks of slightly more than 20 minutes on average, but ranging from 2.3 minutes to 55.2 minutes. The female runs up to the platform and stands on it, before entering the nest. After an incubation period of 21–25 days in the case of the Australian Logrunner and 25 days in the Chowchilla, the eggs hatch.

On emergence from the egg, the chicks have a slight covering of black down. By the time they reach the age of 4–6 days their eyes are open, and by 10–12 days the juvenile plumage has started to emerge, the nestling becoming well feathered by the age of 19–21 days. Ninety percent of the brooding takes place in the first six days after hatching, and brooding ceases entirely by the eleventh day. When the female is feeding nestlings, the male provisions her with food, which she, in turn, presents to the young, but he does not himself feed the chicks. There are records of more than one male Australian Logrunner bringing food to the same female. If a male provides a food item to the female away from the nest, she eats it herself. As the female approaches the nest, she utters a chirring contact call, to which the young often respond with soft begging calls. In studies of Chowchillas, it has been found that the hourly feeding rate increases markedly after the single nestling's 17th day. If the nest is approached too closely by an observer, the female will perform a distraction display, in which she runs to and fro at a distance of about 4–5 m from the observer while giving low growls and occasionally flicking her wing and tail.

The nesting period of the Chowchilla is 22–27 days, whereas that of the smaller Australian Logrunner is 18–19 days. The normal timing is such that the majority of young Chowchillas leave the nest just before the onset of the wet season or during the early stages of it; at this time, the cover of leaf litter is at its greatest. After leaving the nest, young logrunners are fed by both parents. Some observations of Australian Logrunners indicate that when two chicks fledge, each youngster is fed more or less exclusively by one parent. There is a single report of young being fed by an apparent additional adult. The immatures may be accompanied by the parents for up to several months, and they remain in the natal territory for up to about a year.



*The Australian Logrunner is unusual amongst Australian passerines in that its breeding effort is mainly concentrated in the austral winter. The breeding season often starts in May, and runs through to August, or occasionally to January. This schedule is presumably adaptive because hatching therefore coincides with the wet season, when the ground is soft and invertebrate prey most abundant. The clutch typically contains two eggs, and the nestlings are fed by the female for 18–19 days. The two nestlings pictured here are almost fully grown, and ready to leave the nest.*

[*Orthonyx temminckii*, Australia.  
Photo: Glen Threlfo/Auscape]

This photograph shows a young **Australian Logrunner**, perched on a low vine, just after it has been fed by an adult female. The fledged brood is usually fed by both parents, although each individual fledgling may be fed more or less exclusively by one parent, a system known as brood division. Juveniles accompany their parents for prolonged periods, often remaining on the natal territory for several months. This contributes to the impression that logrunners live in small parties, but there is only one convincing report of co-operative breeding in the family.



[*Orthonyx temminckii*,  
Mt Glorious,  
SE Queensland, Australia.  
Photo: Brian J. Coates]

Figures on breeding success are available only for the Chowchilla. The hatching success of this species was about 75%, and, of 18 chicks, 67% successfully left the nest.

### Movements

The movements of these species are not well known, in part because orthonychids have proven difficult to capture and, therefore, to mark. In most areas where logrunners occur, they are recorded throughout the year, and they are generally regarded as sedentary. The few Chowchillas that have been radio-tracked have been found to occupy stable home ranges. Moreover, all recoveries of ringed Australian Logrunners and Chowchillas have been made less than 10 km from the sites where the individuals were initially marked, in the former case almost seven years later.

Movements that have been recorded have been on a local scale. There is evidence that young logrunners will disperse from their natal territories into neighbouring areas, but not for extensive distances. As a result of the sedentary nature of these birds, the composition of groups (see General Habits) remains rather constant, with minimal movement of individuals from one territory to another.

### Relationship with Man

The restricted habitat and cryptic behaviour of these interesting birds make them unfamiliar to the great majority of people. To the casual observer, one of the more familiar aspects of the Orthonychidae is the loud and distinctive voice, from which has resulted the colloquial name of "Auctioneer Bird", applied to the Chowchilla. The word "Chowchilla" is itself derived from the name given to the species by the Dyrirbal Aboriginal people, and is onomatopoeic, being a transliteration of this logrunner's song.

Otherwise, the members of this family appear to have had little, if any, influence on the life of human beings. It is possible that they have sometimes been taken for food, at least in the past, but little information is available on this.

### Status and Conservation

None of the three members of the family is thought to be currently at any risk. The clearance of rainforest has eliminated the Australian Logrunner from parts of its range, but this species

appears capable of holding on in small, isolated patches of rainforest. A population persists in remnants of the Illawarra scrub to the south of the metropolis of Sydney, well separated from the northern section of the species' range. Farther north in New South Wales, a pair was found in a long-isolated 2-ha patch of rainforest surrounded by dairy land in the New England Tablelands. The expressed concern that proliferating exotic plants, such as lantana and blackberry, in and around the rainforest may force this species from its habitat appears to be unfounded. Indeed, the Australian Logrunner seems to have adapted well to thick stands of these plants, using the cover that they provide in order to colonize areas along watercourses and even moving away from rainforest into areas where these vigorously invasive plants have made inroads into cleared land.

Although clearance of vegetation has undoubtedly reduced the amount of habitat available to the Chowchilla, this species remains common in north-eastern Australia. It is, nevertheless, restricted to a rather small area of rainforest in north-east Queensland.

Finally, the New Guinean Logrunner appears to be uncommon to rare, but this may be due, at least in part, to the remoteness of much of its range and to its shy, retiring nature. This point is illustrated by the species' comparatively recent discovery at Tari Gap. Elsewhere, however, it is likely that it is absent, rather than overlooked. This is suggested by the fact that the Fore and Daribi peoples of the Eastern Highlands of New Guinea do not know this species, whereas they know most others in this region; one would expect them to be familiar with the distinctive voice of the New Guinean Logrunner were the species present.

### General Bibliography

- Anon. (2006i), Baird (1985, 1993), Beruldsen (1974), Bettington (1927), Blakers *et al.* (1984), Bock (1994), Boles (1977, 1988, 1993), Boles & Shields (1980), Butchart & Stattersfield (2004), Campbell (1901), Chisholm (1929, 1950, 1951), Clapp (1986), Coates (1990), Cowles (1974), Crome (1978), David & Gosselin (2002b), Deignan (1964a), Dickinson (2003), Disney & Grimes (1985a), Dow (1980), Elliott & Elliott (1931b), Frith, C.B. & Frith (1987), Frith, C.B. *et al.* (1997), Frith, D.W. (1984), Fulton (2001), Higgins & Peter (2002), Hindwood (1934), Howe *et al.* (1981), Jackson (1909a, 1921), Jansen (1999), Joseph & Moritz (1994), Joseph *et al.* (2001), Mack (1934c), Mayr & Meyer de Schauensee (1939b), Mayr & Rand (1937), McGuire (1996), McNamara (1935, 1937), Nichols (2000), Norman *et al.* (2002), North (1904), van Oort (1909b), Ramsay (1868), Rand (1940b, 1942b), Reilly (1991), Ripley (1964a), Schodde & Mason (1999), Sibley (1996), Sibley & Ahlquist (1985, 1990), Sibley & Monroe (1990, 1993), Theimer & Gehring (1999), Verreaux & Lafresnaye (1847), Wolters (1980a), Zusi (1978).





## PLATE 28

## Family ORTHONYCHIDAE (LOGRUNNERS) SPECIES ACCOUNTS

### Genus *ORTHONYX* Temminck, 1820

#### 1. New Guinean Logrunner

##### *Orthonyx novaeguineae*

French: Orthonyx de Nouvelle-Guinée

Spanish: Colaespina Papú  
German: Neuguinea-Stachelschwanzflöter

**Taxonomy.** *Orthonyx Novaeguineae* A. B. Meyer, 1874, Arfak Mountains, New Guinea. Formerly considered conspecific with *O. temminckii*, but recent studies indicate significant genetic differences from latter, possibly even at genus level; also differs vocally. Genetic analysis suggests also the possibility that nominate race may be a separate species from *dorsalis* and *victorinus*; last two races sometimes merged. Racial identity of population recently found in EC New Guinea (Tari area, in Southern Highlands Province) unknown. Three subspecies recognized.

##### Subspecies and Distribution.

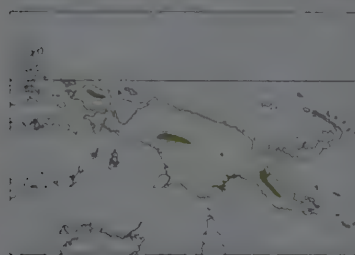
*O. n. novaeguineae* A. B. Meyer, 1874 – Tamrau Mts and Arfak Mts, in NW New Guinea.

*O. n. dorsalis* Rand, 1940 – Nassau and Oranje Ranges, in WC New Guinea.

*O. n. victorinus* van Oort, 1909 – Herzog Mts and Wharton Range, in E New Guinea.

Also (race unknown) in Tari area of EC New Guinea.

**Descriptive notes.** 18.5 cm; male 53–75 g, female 47–58 g. Male nominate race has supercilium and side of face grey, crown dark rufous-brown with darker feather edgings (creating scalloped effect); nape, mantle and back dark brown, each feather broadly edged with black on one web and with pale shaft streak (producing mottled appearance); rump dark rufous-brown; upperwing-coverts black with broad pale grey tips (forming two wingbars); remiges grey-brown, becoming dark brown towards base, primaries with small buff spot on margin of leading web (forming wingbar on closed wing), secondaries with extensive buff-rufous edging, increasing in width inwards, outer web of tertials almost entirely buff-rufous; tail grey-brown; chin, throat and upper breast white with slight black border, breast side extensively dark grey (leaving only reduced white section along mid-line), lower breast and belly white.



flanks and undertail-coverts olive-brown and grey; iris dark brown; bill black; legs blackish. Female like male, but somewhat brighter on upperparts, and with chin to upper breast orange-rufous, black border often absent. Juvenile is buffy brown above and below, feathers of back broadly edged blackish, feathers of underparts more narrowly dark-edged. Race *dorsalis* has black margins of upperpart feathers wider and breast side darker grey than nominate; *victorinus* has darker rump, reduced white below. Voice. Song 4–6 descending repetitive whistled notes, first 2–3 close together, last rather drawn out, as “tee too too too too” or “tsee too tee too”. Also a low “eeee” when disturbed.

**Habitat.** Mainly upper montane forest at 1980–2840 m, possibly to 3450 m; locally down to 1200 m in W of range.

**Food and Feeding.** Insects and other invertebrates. Forages on forest floor; few data on behaviour.

**Breeding.** Nests with egg in Mar and late Nov, juveniles in Sept and Nov, and male in breeding condition in late Apr. Nest a small, rounded dome with side entrance, built of moss, root fibres and plant stems, with inner lining of thickly woven soft fibres, external diameter c. 12.7 cm, placed on ground. Clutch 1 egg, plain white, 29–33.6 × 22–22.7 mm; no information on incubation and nestling periods.

**Movements.** Very probably sedentary.

**Status and Conservation.** Not globally threatened. Generally scarce to rare; locally common in NW of range (Vogelkop). True abundance of species difficult to assess, because it is quiet, cryptic, and easily overlooked.

**Bibliography.** Clapp (1986), Coates (1990), Frith & Frith (1987), Iredale (1956), Joseph *et al.* (2001), Mayr & Meyer de Schauensee (1939b), Mayr & Rand (1937), Norman *et al.* (2002), van Oort (1909b), Rand (1940b, 1942b), Rand & Gilliard (1967), Ripley (1964a).

#### 2. Australian Logrunner

##### *Orthonyx temminckii*

French: Orthonyx de Temminck

Spanish: Colaespina de Temminck  
German: Australien-Stachelschwanzflöter

**Other common names:** Brown/Spine-tailed/Southern Logrunner, Spine-tailed Chowchilla, (Jungle) Spinetail, Scrubquail, Scrubhen

**Taxonomy.** *Orthonyx Temminckii* Ranzani, 1822, Hat Hill, near Nowra, New South Wales, Australia. Formerly considered conspecific with *O. novaeguineae*, but recent studies indicate significant genetic differences from latter, possibly even at genus level; also differs vocally. Monotypic.

**Distribution.** 1. Australia, from extreme SE (Queensland) (Bunya Mts) S in mountain ranges and coastal regions to CE New South Wales (Illawarra district).

**Descriptive notes.** 18–21 cm; male 58–75 g; female 49–58 g. Male has supercilium and side of face grey, crown dark rufous with faint darker edging of feathers (creating scalloped effect); nape,



mantle and back brown, each feather broadly edged with black on one web and with pale shaft streak (producing mottled appearance), rump rufous; upperwing-coverts black with broad pale grey tips (forming two wingbars); remiges grey-brown, becoming dark brown towards base, primaries with small buff spot on margin of leading web (forming bar on closed wing), secondaries with extensive buff-rufous edging, increasing in width inwards, outer web of tertiaries almost entirely buff-rufous; tail grey-brown; chin, throat and upper breast white with black border, breast side grey, lower breast and belly white, flanks and

undertail-coverts olive-rufous; iris dark brown; bill and legs black. Female is like male, except that chin, throat and upper breast are orange-rufous. Juvenile has upperparts rusty rufous, feathers with pale central streaks and blackish-brown tips, wing as adult but with markings pale rufous-buff, underparts light rusty with black-brown mottling, lighter on belly; immature as respective adult but retains most of juvenile wing feathers, has wingbars buff. Voice. Song, given in early morning and late evening (rarely during day), a loud, penetrating, high-pitched "kweek, be-kweek-kweek-kweek-kweek", with territorial and possibly courtship function; also "tu-weet-weet-weet", given 3–4 times. Contact call a loud double "kweet" note, occasionally given singly; chattering series of rapid staccato notes; alarm note shrill and piercing.

**Habitat.** Subtropical and temperate rainforest, edges of contiguous wet sclerophyll forest and dense fringing vegetation, including introduced species such as lantana (*Lantana*) and blackberry (*Rubus fruticosus*).

**Food and Feeding.** Insects and other small soil invertebrates. Forages mostly on ground; activity starts at first light. Initially removes larger objects (e.g. sticks, rocks) on surface by sideways kicks of feet, with bill occasionally used; once top layer of leaf litter removed, subsequent scratching involves front-to-back movement of legs and feet, often using tail as brace while moving on circular course, thereby creating distinctive cleared circular patches in leaf litter.

**Breeding.** Season May–Aug, sometimes earlier or later (extremes Mar–Jan); one or two broods per season. Territorial throughout year, territory defended aggressively by both sexes. Male feeds female during courtship, and also at other times during year. Nest, built by female alone, taking c. 1 month, domed, with side entrance opening at ground level and continuing inside as corridor, built of leaves, leaf litter, twigs, sticks, moss and ferns, lined with moss, grasses and plant fibres; external height 17.8–30.5 cm, external diameter 21.6–45.7 cm, entrance platform (7.5–30 cm) of sticks and leaves matted with moss extending from entrance; usually placed on ground against trunk or clump of vegetation, sometimes up to 1.2 m above ground in dense vegetation. Clutch usually 2 eggs, sometimes 1 or 3, white, average 28.7 × 21.3 mm; incubation by female alone, sitting for c. 75% of daylight hours, in stints of 6.2–132.8 minutes (mean 69.2 minutes), with breaks of 2.3–55.2 minutes (mean 20.7 minutes), incubation period 21–25 days; chicks fed by female, leave nest at 18–19 days; fledglings fed by both parents, although often each young fed more or less exclusively by one parent; single observation of an apparent additional adult feeding young; juveniles may remain with parents for several months. Maximum recorded longevity more than 6 years 9 months.

**Movements.** Sedentary. Recoveries of marked individuals all less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Common in N part of range, decreasing towards S, until becoming rare at S limits. Adversely affected by modification of habitat, including clearance and fragmentation; may persist in fragments 1–2.5 ha in size, but rarely survives in smaller remnants. Concerns about effects of introduced plant species appear largely unfounded, as this species has adapted to these; will use alien vegetation when latter is contiguous with wetter forest habitat.

**Bibliography.** Ames (1975), Beruldsen (1974), Bettington (1927), Boles (1977, 1988), Boles & Shields (1980), Campbell (1901), Chisholm (1929), Dow (1980), Elliott & Elliott (1931b), Favaloro (1931), Higgins & Peter (2002), Hindwood (1934), Hoskin (1991), Howe *et al.* (1981), Jackson (1921), Joseph *et al.* (2001), Mack (1934c), Marshall (1935), McNamara (1935, 1937), Nichols (2000), Norman *et al.* (2002), North (1904), Reilly (1991), Schodde & Mason (1999), Stokes (1979), Vaughan & Haynes (1981), Verreaux & Lafresnaye (1847).

### 3. Chowchilla

#### *Orthonyx spaldingii*

**French:** Orthonyx de Spalding

**Spanish:** Colaespina de Spalding

**German:** Schwarzkopf-Stachelschwanzflöter

**Other common names:** Black-headed/Northern/Spalding's Logrunner, Northern Chowchilla, Spalding's Spinetail

**Taxonomy.** *Orthonyx* [sic] *spaldingii* E. P. Ramsay, 1868, Rockingham Bay, Queensland, Australia. Two subspecies recognized.

#### **Subspecies and Distribution.**

*O. s. melasmenus* Schodde & Mason, 1999 – NE Australia in coastal ranges from Mt Amos and Mt Finnegan S to Thornton Range (NE Queensland).

*O. s. spaldingii* E. P. Ramsay, 1868 – Macalister and Herberton Ranges S to Seaview and Paluma Ranges (NE Queensland).



**Descriptive notes.** 24–29 cm; male 150–215 g, female 113–144 g. Male nominate race has crown and nape black, eyering pale blue-grey, upperparts dark olive-brown, upperwing dark olive-brown, tail dark black-brown; chin, throat and underparts white, flanks dusky; iris dark brown; bill and legs black. Female is similar to male, but has chin, throat and breast orange-rufous. Juvenile has upperpart feathers rusty rufous with pale central shafts and blackish-brown tips, upperwing-coverts tipped dark rufous, underparts rusty rufous with darker mottling; immature similar to respective adult, but retains most of juvenile feathers

of wing (particularly coverts) and tail. Race *melasmenus* is smaller and darker than nominate, with black of nape not clearly demarcated from mantle, bill proportionately longer. Voice. Song a loud, ringing "chow-chilla-chow-chow-chilla" or "chow-chook-chook chow-chook-chook" with rhythmic, chanting quality, sharp bursts connected by warbling sounds; detectable dialects used over areas of 26–75 ha, occupied by a number of groups, with sharp borders between dialects usually corresponding to topographic features (e.g. stream, ridge). Quiet song a soft version given by widely separated members of group. Calls include hen-like clucking when agitated or alarmed and during chases, and low throaty "grrr grrr grrr" by individuals when foraging close together; alarm a loud squawk.

**Habitat.** Tropical rainforest, including primary forest and areas of regrowth 20–30 years old, usually with dense undergrowth. At 450–1500 m; also, uncommonly, in some lowland areas with high amount of rainfall.

**Food and Feeding.** Insects and other terrestrial invertebrates; occasionally frogs, small lizards, and seeds. Forages on ground. Initially removes leaf litter and larger objects by sideways kicks with feet, and then, once ground exposed, uses legs alternately to scratch from front to back on ground, picking up uncovered food items with bill, tail occasionally used as brace; produces characteristic cleared patches in leaf litter. Often attended by other birds, including Grey-headed Robin (*Heteromyias cinereifrons*), Eastern Whipbird (*Psophodes olivaceus*), Yellow-throated Scrubwren (*Sericornis citreogularis*), Fernwren (*Oreoscoptes gutturalis*) and Black-eared Catbird (*Ailuroedus melanotis*), and by mammals, e.g. musky rat-kangaroo (*Hypsiprymnodon moschatus*).

**Breeding.** Season extends throughout year, eggs in May–Feb (usually Jul–Dec), young leave nest in wet season; usually one brood per season. Monogamous, forms permanent pair-bond; lives in groups, but co-operative breeding unreported, although female often provisioned by two males. Territorial all year. Nest, built by female, taking from 2 weeks to several months, a large, bulky domed structure with side entrance and approach platform, made of sticks, lined internally with fine rootlets and moss; externally 11.5–25 cm (mean 20.1 cm) high, 22–30 cm (24.8 cm) wide, 23–30 cm (27.9 cm) deep, entrance 6.2–10.5 × 16–20 cm (7.7 × 10 cm), entrance platform 2–20 cm (10.7 cm); hidden in low dense vegetation on or near ground, occasionally up to 3.5 m, or placed on plant, such as tree-fern. Clutch 1 egg, white, average 37 × 26.3 mm; incubation by female, sitting for 46–58% of time, period 25 days; chick fed by female, leaves nest at 22–27 days, thereafter fed by both parents; young accompanies adults for several months, and may remain in natal territory for c. 1 year. Hatching success of 20 eggs 75%; fledging success of 18 chicks 67%.

**Movements.** Sedentary. All recaptures of marked individuals made less than 10 km from initial ringing site.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Queensland Wet Tropics EBA. Common. Has suffered some reduction of range as a result of habitat loss, but no obvious current threats.

**Bibliography.** Binns (1954), Boles (1977, 1988), Bravery (1970), Campbell (1901), Chisholm (1950, 1951), Cowles (1974), Crome (1978), Frith, C.B. *et al.* (1997), Frith, D.W. (1984), Fulton (2001), Higgins & Peter (2002), Jackson (1909a), Jansen (1999), Joseph & Moritz (1994), Joseph *et al.* (2001), Lavery (1986), Lavery *et al.* (1968), Mack (1934c), McGuire (1996), Norman *et al.* (2002), North (1904), Ramsay (1868, 1876), Schodde & Mason (1999), Theimer & Gehring (1999), Zusi (1978).



Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family EUPETIDAE**  
**(JEWEL-BABBLERS AND ALLIES)**



- Small to medium-sized passerines, most with rounded wings and strongly developed legs, rather long to very long tail sometimes fan-shaped, and fairly straight bill; plumage highly variable, from all black to variegated brown, grey, black and white.
- 16–30 cm.



- Australia and New Guinea; one species in SE Asia.
- Forest, woodland and arid desert.
- 7 genera, 18 species, 50 taxa.
- No species threatened; none extinct since 1600.

### Systematics

This heterogeneous family, as currently constituted, contains 18 species, divided among seven genera. With the exception of the Rail-babbler (*Eupetes macrocerus*), which occurs in extreme south Thailand, Peninsular Malaysia, Sumatra and Borneo, the family is restricted to Australia, which has eight species in two genera, and New Guinea, with nine species in five genera. The family's members spend most of their time on the ground, but, apart from shared adaptations to this mode of life, many have few other obvious links to each other. The taxonomic histories of these seven genera are characterized by shifts between different families. Long dumped amongst the babblers, either in the family Timaliidae or in a broad version of Muscicapidae, by the time they were covered in J. L. Peters's *Check-list of Birds of the World* they were treated together with the logrunners (*Orthonyx*) as constituting a subfamily Orthonychinae. Starting in the mid-1970s, DNA–DNA hybridization studies have indicated that most are, in fact, components of the autochthonous Australo-Papuan songbird assemblage. Further molecular work has refined the relationships of some genera and, in so doing, has raised doubts that they constitute a natural group. Increasingly, it has been shown that this family is largely a convenient "catch-all" category. The three logrunners have been found to be genetically a very distinct group and have, therefore, been separated at the family level, taking with them the name Orthonychidae. With the removal of this genus, the next available name for the present family is Eupetidae, which has priority over the commonly used name Cinclosomatidae.

Molecular-genetic studies, mainly using DNA sequences, indicate that there are several unrelated subgroups in Eupetidae. Unfortunately, several taxa have not yet been included in any published study. Amongst these until very recently was the Rail-babbler, from which the family as currently constituted takes its scientific name; this is a distinctive Oriental species of notoriously uncertain affinities, and even when it was placed with the true babblers, there was barely a hint as to which genus might be its closest ally. Now a study by K. A. Jønsson and colleagues, published in 2007, supports a close relationship of the Rail-babbler with the anomalous African genera *Chaetops* (rockjumpers) and *Picathartes* (picathartes), though with the surprising biogeographical implications perhaps it offers more questions than answers!

The jewel-babblers (*Ptilorrhoa*) of New Guinea were once placed in the same genus as the Rail-babbler, but there is little to associate them. Osteologically, the jewel-babblers are almost inseparable from the quail-thrushes (*Cinclosoma*), and a close relationship between the two has been supported by molecular evidence, mostly still unpublished. The members of these two genera are similar in size and shape, perhaps the most notable difference being in the coloration of the plumage. Both comprise well-circumscribed groups, but the number of species to be recognized in each remains a matter of debate. The Spotted Jewel-babbler (*Ptilorrhoa leucosticta*) and the Chestnut-backed Jewel-babbler (*Ptilorrhoa castanonota*) are distinctive in plumage. Although traditionally considered to be a subspecies of the Blue Jewel-babbler (*Ptilorrhoa caerulea*), the Dimorphic Jewel-babbler (*Ptilorrhoa geislerorum*) appears to warrant recognition as a full species. Attention has been drawn to the differences between the two taxa in plumage, behaviour and vocalizations. In addition, inland from Madang, where the two occur together, they are largely separated altitudinally, the Dimorphic Jewel-babbler inhabiting the higher country.

No agreement has yet been reached on the number of species of quail-thrush that should be recognized. The Painted Quail-thrush (*Cinclosoma ajax*) of New Guinea and the Spotted (*Cinclosoma punctatum*) and Chestnut Quail-thrushes (*Cinclosoma castanonotum*) of Australia present no difficulties in delimitation. The remaining populations, however, have been treated variously as four species or as two, although in differing combinations. Current practice by the majority of workers is to treat the Nullarbor Plain taxon *alisteri* as a subspecies of the Cinnamon Quail-thrush (*Cinclosoma cinnamomeum*), and to keep the western population *marginatum* as a subspecies of the Chestnut-breasted Quail-thrush (*Cinclosoma castaneothorax*). In the past, *alisteri* has sometimes been regarded as a subspecies of the Chestnut-breasted Quail-thrush and *marginatum* as a race of the Cinnamon Quail-thrush, and both have at times been considered to represent two separate species, respectively the "Nullarbor Quail-thrush" and the "Western Quail-thrush".

A second group within the Eupetidae consists of the whipbirds and wedgebills comprising the genus *Psophodes*. While these four species have, at times, been placed in the Timaliidae, or with the whistlers in Pachycephalidae, or with the shrike-tits in an expanded family Falcunculidae, the last an artificial collection

of Australian species sharing the feature of a crest, there has been little debate as to whether or not the whipbirds and wedgebills form a natural group. It has been suggested that anatomical characters serve to connect *Psophodes* with the *Ptilorrhoa* jewel-babblers, but this has not been investigated in any detail.

The Eastern Whipbird (*Psophodes olivaceus*) and the Western Whipbird (*Psophodes nigrogularis*) form an obvious species pair. Much has been written about these birds as an example of species formation in southern Australia. J. R. Ford pointed out the similarities between the whipbirds and the wedgebills in crest, bill morphology, patterning of the tail, development of the wings and legs, and the eggs and nest. He considered the wedgebills, which were at that time treated as a single species and placed in the monotypic genus *Sphenostoma*, as the arid-country representative of the whipbirds. The Western Whipbird is somewhat intermediate in plumage colour between the Eastern Whipbird and the wedgebills. It occurs as several small, isolated populations in mallee country of south-west and southern Australia, including Kangaroo Island, and in the coastal heathlands of the south-western corner. In a recent taxonomic revision, the mallee-dwelling populations were split off as a separate species, the "Mallee Whipbird", leaving the Western Whipbird restricted to a single population in the south-western heaths. Molecular data pertaining to the last-mentioned population and to that of Kangaroo Island do not, however, support this treatment. Comparable information for the other forms is required before the case for recognition of a second species can be properly assessed.

Ford and S. A. Parker proposed that there may be two species of wedgebill, a conclusion based on the very different voices of the eastern and western individuals. Wedgebills for which the song types were known were collected and compared. There were essentially no differences in size, and the only constant plumage variation was the presence of light streaking on the underparts of eastern individuals, the streaks often disappearing on more abraded feathers. Some distinctions also in habitat and behaviour were identified. The two forms approach each other very closely around Oodnadatta, in central Australia, but the nature of their interactions, if any, has not been investigated.

The Papuan Whipbird (*Androphobus viridis*) has not been studied, but its similarities in plumage to the Australian whipbirds suggest that its relationships may lie with the latter. It was originally placed in the genus *Androphilus*, now a synonym of the bush-warbler genus *Bradypterus*, because of its perceived simi-

larity to the Friendly Bush-warbler (*Bradypterus accentor*). When it was removed to its own monotypic genus, the authors of this new genus rectified what had been an anomaly in the way in which the species was perceived: the name *Androphilus* means "man-loving", whereas *Androphobus* has the opposite meaning, "man-fearing", which seems more appropriate for this very poorly known and apparently reclusive eupetid.

Another enigmatic genus is *Melampitta*, which is confined to New Guinea. In appearance, its two species are very reminiscent of pittas (Pittidae) and they were, indeed, originally placed in that family. Examination of the syrinx, however, revealed that this assumed relationship was not a valid one, and the genus was subsequently transferred to the babbler family, Timaliidae, and eventually to the Orthonychidae. On the basis of their DNA-DNA hybridization studies, C. G. Sibley and J. E. Ahlquist concluded that the Lesser Melampitta (*Melampitta lugubris*), and thus, by implication, the Greater Melampitta (*Melampitta gigantea*), belonged with the birds-of-paradise (Paradisaeidae), as the sister-group to the other species in that family. On the other hand, differences in terrestriality, nest construction, egg patterning, vocalizations and aspects of breeding biology (see Breeding) led C. B. Frith and D. W. Frith to reject the suggestion of a relationship with the typical birds-of-paradise, although there are some similarities between the melampittas and the cnemophiline birds-of-paradise, the latter now often separated at the family level as the Cnemophilidae. Preliminary and still incomplete DNA-sequencing results indicate a closer, but not necessarily close, affinity with the Corcoracidae, an Australian family comprising just the White-winged Chough (*Corcorax melanorhamphos*) and the Apostlebird (*Struthidea cinerea*).

Recent authors have generally accepted that the two melampitta species are congeneric, but some niggling doubt has been expressed. Although both species are entirely black in adult plumage, the Greater Melampitta is much larger than its relative and, furthermore, has the shafts of the wing and tail feathers usually stiffened, as well as possessing a proportionately longer tail and a more robust hooked bill, and it differs also in leg development. There are also disparities between the two in ecology and, probably, in nesting behaviour.

The Blue-capped Ifrit (*Ifrita kowaldi*) differs from other members of the family both in appearance and in behaviour. It lives in trees, rather than on the ground, and it lacks the obvious robustness of the legs of the other, terrestrial forms. The bright blue

As currently arranged, the family Eupetidae contains seven genera. Preliminary DNA sequencing suggests that these might better be grouped into four, perhaps six, separate families, which would leave the Rail-babbler as the only member of Eupetidae. This species gives the family (as constituted herein) its name, taking priority over the more commonly used "Cinclosomatidae". The only member of the family occurring outside Australasia, the Rail-babbler is structurally fairly typical of the family, having strongly developed legs, a long neck and a very long, fan-shaped tail.

[*Eupetes macrocerus macrocerus*,  
Johor,  
Peninsular Malaysia.  
Photo: Morten Strange/  
VIREO]







The genus *Cinclosoma* comprises five species of which one occurs in New Guinea and four, including the **Chestnut Quail-thrush**, in Australia. All are rather dumpy, long-tailed, stout-legged birds whose attractively plumaged males are garbed in various combinations of chestnut, black and white. Four quail-thrushes have the short, rounded wings typical of sedentary, terrestrial birds that inhabit dense vegetation. As can be inferred here, the Chestnut Quail-thrush has less rounded wingtips than its congeners, which is probably an adaptation to its more open environment.

[*Cinclosoma castanotum castanotum*, Lake Gilles Conservation Park, South Australia, Australia. Photo: Peter Fuller]

feathering on the crown has obviously been a contributory factor in suggestions of a relationship with the Old World flycatcher genus *Niltava* and with the Australo-Papuan fairywrens (Maluridae), while some aspects of its skull morphology resemble those of the Pachycephalidae. There are still no clear signals concerning whereabouts among the songbirds the Blue-capped Ifrit should be placed.

Molecular evidence, some of it still unpublished, indicates that several groups of these taxa should perhaps be segregated at the family level, because there appears to be no close relationship among them or with other groups of birds. If so separated, the assemblage of quail-thrushes and perhaps jewel-babblers would take the name Cinclosomatidae. The Australian whipbirds and wedgebills, and possibly also the Papuan Whipbird, could be isolated as the Psophodidae, a family name erected by C. L. Bonaparte in 1854. It is not obvious what would be the best treatment for the melampittas and the Blue-capped Ifrit. They, too, may warrant their own respective families. If these taxa are allocated to other families, the Rail-babbler would remain as the sole member of Eupetidae.

### Morphological Aspects

The species currently included within Eupetidae share some rather generalized characteristics. These include some that reflect their heavy reliance on terrestrial or semi-terrestrial locomotion. Otherwise, they present a rather diverse range of appearances. Two traits associated with the preference for thick vegetation and a largely terrestrial lifestyle are rounded wings and strongly developed legs. The longest primary of eupetids is usually number P6, but occasionally P7 or P5. A notable exception to this general rule is provided by the quail-thrushes, in which primary P8 is the longest. Given the more open habitat in which these birds live, this less rounded shape is not surprising. The length of the tarsus in this family is 30–37% the length of the wing, except in the case of the Lesser Melampitta, which has relatively long legs, albeit proportionately slender ones, with a tarsus:wing ratio of about 46%. The larger Greater Melampitta has relatively shorter but stronger tarsi. Among other species, most notably the quail-thrushes, the tarsi are robust.

Most members of the family have a rather straight bill with the culmen slightly curved, and the tip of the upper mandible often marginally overhanging that of the lower mandible. The bill of the whipbirds and wedgebills is more laterally flattened, wedge-shaped and proportionately deeper and shorter than that of other members of the family. The bill length of eupetids, measured from the tip to the point of insertion into the skull, is approximately one quarter that of the wing. The jewel-babblers have a slightly longer bill. Rictal bristles are greatly reduced in all species in this family.

The tail may be longer than the wing, slightly so in the case of the quail-thrushes, the jewel-babblers, the Papuan Whipbird and the wedgebills, and exceptionally so in the Australian whipbirds and the Rail-babbler, these longest-tailed species having a tail 1.3–1.47 times the length of the wing. The tail of all of these species is fan-shaped and, except in the case of the jewel-babblers, the outer rectrices are often strongly tipped with white. In contrast, the Lesser Melampitta and the Blue-capped Ifrit have a tail that is short, only 70–75% as long as the wing, square-ended and uniformly coloured. The Greater Melampitta has a substantially longer tail than its congener, equivalent to 85–98% of the wing length.

The plumage of most species is thick and often fluffy. There is a wide range of plumage colours and patterns. The most complex are those of the quail-thrushes, plump, long-tailed birds that superficially resemble doves (Columbidae) in appearance and in some aspects of behaviour. Their plumages are combinations of various browns, greys, black and white. The upperparts are cryptic and have come to resemble the colour of the soil in the places where the birds live; the underparts, however, are boldly marked with contrasting bands and patches of colour. Quail-thrushes are sexually dimorphic, the males being larger and brighter than the females.

Jewel-babblers somewhat resemble quail-thrushes in shape, but their plumages lack the intricate patterning of the latter and they exhibit extensive areas of blue, often with large areas of chestnut. Sexual dimorphism is apparent, but is usually less pronounced than in the quail-thrushes. An exception is the *Dimorphic Jewel-babbler*, both sexes of which have a white throat and a black facial patch, but the remainder of the plumage is blue in the male and chestnut in the female. The Rail-babbler shows some

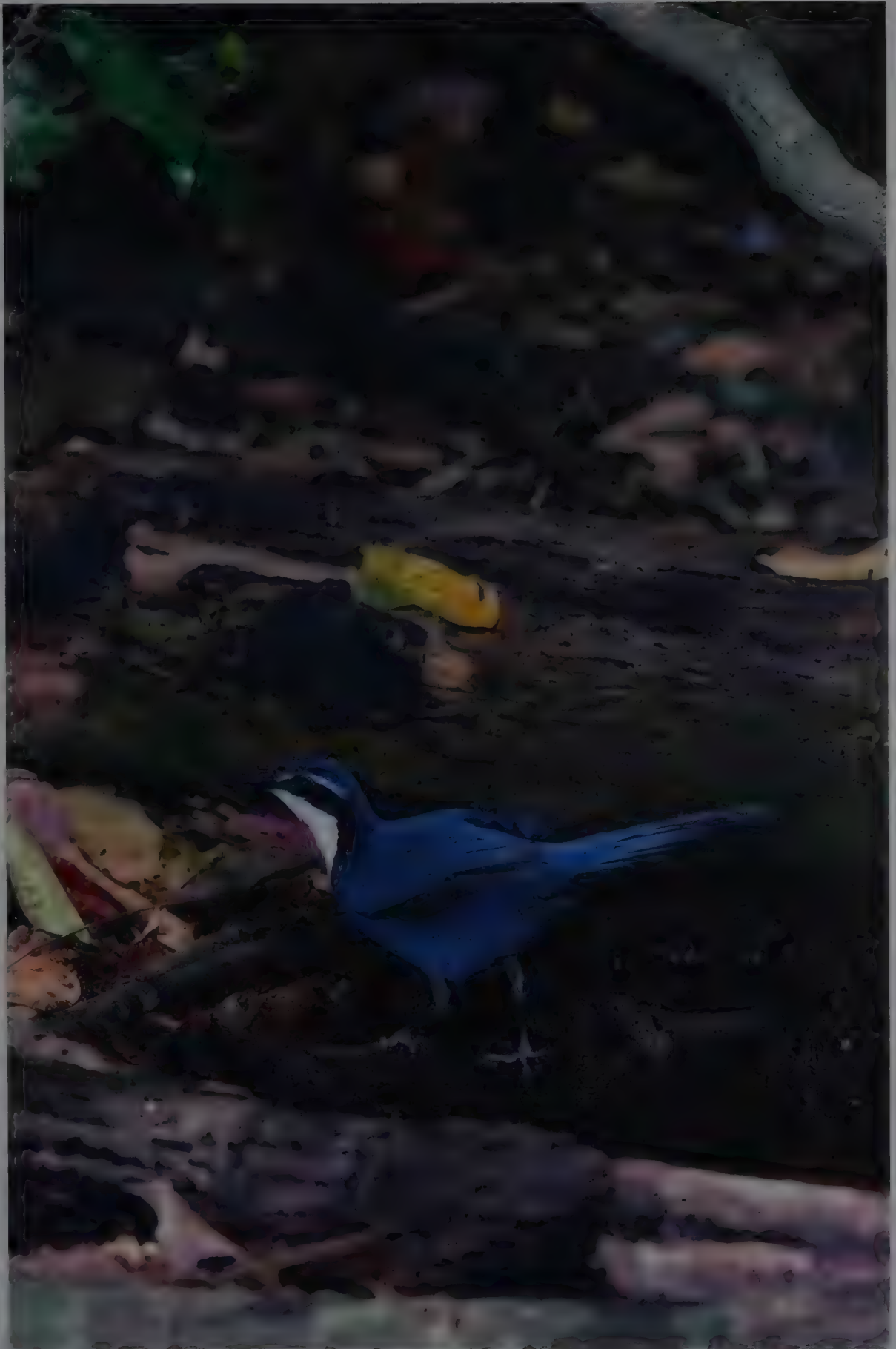
The jewel-babblers were once placed in the same genus as the Rail-babbler (*Eupetes macrocerus*), but there is little to associate them other than superficial similarity. The four species of jewel-babbler are restricted to the island of New Guinea, where the large surface area and complex topography have enabled the radiation of a total of 18 subspecies.

The **Blue Jewel-babbler** was traditionally considered conspecific with the Dimorphic Jewel-babbler (*Ptilorrhoa geislerorum*), but the two species show altitudinal separation in their areas of overlap in the north of the island, and also differ in behaviour, vocalizations and the plumage of females. The jewel-babblers are closely related to the *Cinclosoma* quail-thrushes, and DNA evidence suggests that the two genera could be hived off into their own family. The jewel-babblers are long-tailed and short-winged and, as can be seen here, have the stout legs essential for a terrestrial existence.

All species have a fan-shaped tail, with the outer rectrices tipped white. As their common name suggests, the jewel-babblers are lavishly-plumaged, the four species exhibiting a variety of chestnut, black, white, blue or green feathering.

[*Ptilorrhoa caerulescens*  
*nigricrissus*,  
near Brown River,  
SE New Guinea.

Photo: Brian J. Coates]







In the past the genus *Psophodes* was variously placed with the babblers (*Timaliidae*) or the whistlers (*Pachycephalidae*), or in an assorted Australian crested assemblage, *Falcunculidae*. *Psophodes* comprises two species pairs, the whipbirds and wedgebills. Although not the most obvious of congeners, both groups sport a conspicuous crest, in the whipbirds pointing backwards, in the wedgebills slightly forwards, as in this **Chiming Wedgebill**. The two wedgebills were previously considered conspecific, but were split on the basis of vocalizations.

[*Psophodes occidentalis*, North-west Cape, Western Australia, Australia.  
Photo: Hans & Judy Beste/Lochman Transparencies]

similarities to the jewel-babblers in its general appearance, but it is more slender, with a long neck and tail. Most of its plumage is chestnut, but the face and the neck side are boldly marked with a white stripe and a black stripe, and it has a thin patch of blue skin running along the side of the neck.

Whipbirds and wedgebills are slender, long-tailed eupetids with drably coloured plumage. The whipbirds are mainly olive, with varying amounts of black on the head and a prominent white patch or stripe on the cheek. Wedgebills lack even this amount of colour. They are light brown all over, except for a somewhat darker tail and white edging on some of the rectrices. Both groups sport a conspicuous crest. That of the whipbirds is directed backwards, towards the rear of the head, whereas the crest of the wedgebills is thinner, straighter and slightly forward-curling. The male Papuan Whipbird superficially resembles a small and relatively shorter-tailed version of the two Australian whipbirds, having an olive-green back, a black face, throat and breast, and a white moustachial line; it lacks a crest. The female is much duller and does not have the moustachial stripe.

Melampittas are pitta-like birds with long legs and, when adults, wholly black plumage. The forecrown feathers of the Lesser Melampitta are erectile, iridescent and plush-like, in some ways reminiscent of some birds-of-paradise. Those of the much larger Greater Melampitta are similar but lack the iridescence. The combination of the birds' shape and colour is referred to in the generic name *Melampitta*, meaning "black pitta". Initially, the two species were placed in Pittidae, until it was shown that their syrinx had the structure characteristic of oscine, rather than suboscine, passerines. As well as its larger body size, the Greater Melampitta has a much more robust bill and a longer tail than the Lesser. Several specimens show areas of rusty-brown in the plumage, and it has been assumed that this is indicative of immaturity. The rachides of the remiges and rectrices of the Greater Melampitta are stiffened, and those of the rectrices project several millimetres beyond the tip of the tail. Other peculiar features of this species include marked and asymmetrical wear of these feathers, suggested as being related to its unusual subterranean roosting habits (see Habitat); and a small, conical bony spur 1 mm in length at the bend of the wing. Most specimens of this species also have around the eyes an abundance of egg cases of feather mites, which are lacking in the Lesser Melampitta.

The Blue-capped Irit is a small bird, mostly rusty brown, with a contrasting bright blue-and-black cap. Its plumage texture

lacks the looseness characteristic of other members of the family. Intriguingly, this species has been shown to carry several types of toxin in its tissues, particularly in the feathers. The purpose of this poison is unclear, but its acquisition appears to be related to the bird's diet. *Ifrita* is one of two avian genera of New Guinea known to have such toxins, the other being *Pitohui*, the pitohuis, which are members of the *Pachycephalidae*.

Sexual dimorphism is, as intimated above, well pronounced in the quail-thrushes, the jewel-babblers and the Papuan Whipbird. Females of the Papuan Whipbird and of the quail-thrushes have drab, less colourful plumages than those of the respective males. The sexual differences displayed by the Blue Jewel-babbler are minor in some populations and conspicuous in others. For instance, females of the subspecies *nigricrissus* in south-eastern New Guinea have a thin white supercilium, lacking in the males, whereas females of the nominate race in the Vogelkop have the blue of the male entirely replaced by chestnut.

The full sequence of plumages is not known for all species. Most of those for which there is adequate information appear to possess an immature plumage, worn between the juvenile and adult plumages. These immatures often resemble the adult and may not always be easily separated. Because a partial post-juvenile moult appears to be undertaken by most members of the family, it is possible to identify immatures by the retained juvenile wing-coverts. Some of the handful of Greater Melampitta specimens have varying amounts of brown feathers mixed with the black of adult plumage, and it is assumed that this partially brown plumage represents the immature stage. Compared with adults, juveniles have looser plumage, with reduced patterning. The fully feathered nestling Eastern Whipbird is a dull olive-brown, lacking any other markings. It does, however, sport a small crest even at this early stage.

## Habitat

This family is represented in a wide variety of habitats, with some members in tropical rainforest, others in temperate woodland and some in arid deserts. The Rail-babbler and the New Guinea species are inhabitants of the rainforest, occupying a variety of closed forest types. Within this broad category, the majority of the species are found in mountain forest, but the Blue-capped Irit lives in high-altitude moss forest, while the Rail-babbler occurs in



The generic name *Melampitta* means "black pitta", and the two species were originally placed in Pittidae along with true pittas, which they superficially resemble. Subsequently, the genus has had temporary homes in several other families. Further work may suggest that the enigmatic genus *Melampitta*, endemic to New Guinea, merits its own family, and certainly the **Lesser Melampitta** is peculiarly short-tailed for a eupetid. Due to morphological differences, there is some doubt whether the second species of *Melampitta*, the Greater (*M. gigantea*), should be included in the same genus.

[*Melampitta lugubris longicauda*,  
Tari Gap,  
Papua New Guinea.  
Photo: Clifford &  
Dawn Frith]



broadleaf evergreen forest. Several eupetids move into adjacent regrowth if the undergrowth is sufficiently dense.

The tropical species show marked altitudinal zonation. The Painted Quail-thrush and the Rail-babbler are birds of the lowlands, ranging from sea-level up to about 800 m and 1600 m, respectively. High-altitude species are the Papuan Whipbird, which ascends to 2800 m, the Lesser Melampitta, which reaches 3500 m, and the Blue-capped Ifrit, which is found mainly at 2000–2900 m but in some places occurs to 3680 m. The phenomenon of altitudinal replacement is well illustrated by the jewel-babblers. In many parts of New Guinea, three of these species succeed each other at different elevations. The Blue Jewel-babbler occupies the lower elevations and foothills to about 300 m, at about which point the Chestnut-backed Jewel-babbler is found, the latter continuing up to an elevation of around 1450 m; the Spotted Jewel-babbler overlaps with that species in a small zone at 1200–1450 m, but it extends upwards to 2700 m. In some ranges, the interactions are more complicated and less well understood. Where the Dimorphic and Blue Jewel-babblers occur together in the Adelbert Mountains, in north-east New Guinea, there appears to be no difference between them in their preferred hill-forest habitats.

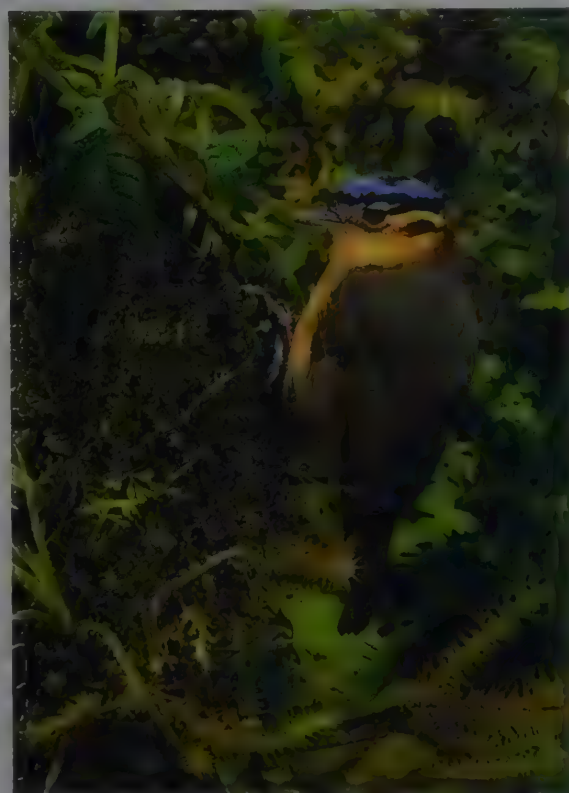
While the Greater Melampitta, too, is a rainforest bird, what is notable about its habitat is the rugged limestone terrain, or karst, on which it occurs. It roosts and supposedly nests in deep, vertical-walled sinkholes below ground level. The narrowness of the sinkholes, leading to the need to reduce plumage abrasion when moving through them, has been forwarded as the reason why this species has the feathers of its wing and tail stiffened (see Morphological Aspects).

Altitudinal zonation among the Australian eupetids is restricted to the Eastern Whipbird, the only member of this group that occurs in rainforest. The nominate race in the south-eastern part of the mainland lives from sea-level up to somewhat over 1000 m in the ranges. Individuals of the subspecies *lateralis*, inhabiting the Atherton Tableland of north-east Queensland, are a little more restricted, occupying mainly a zone at 300–1500 m, although in some areas with very heavy rainfall they extend to coastal districts. In addition to rainforest, this species is found in temperate wet eucalypt (*Eucalyptus*) forest, riparian forest and gully forest, where it is perhaps more frequent. It can be found also in other habitats with low dense undergrowth, including even exotic pine (*Pinus*) plantations.

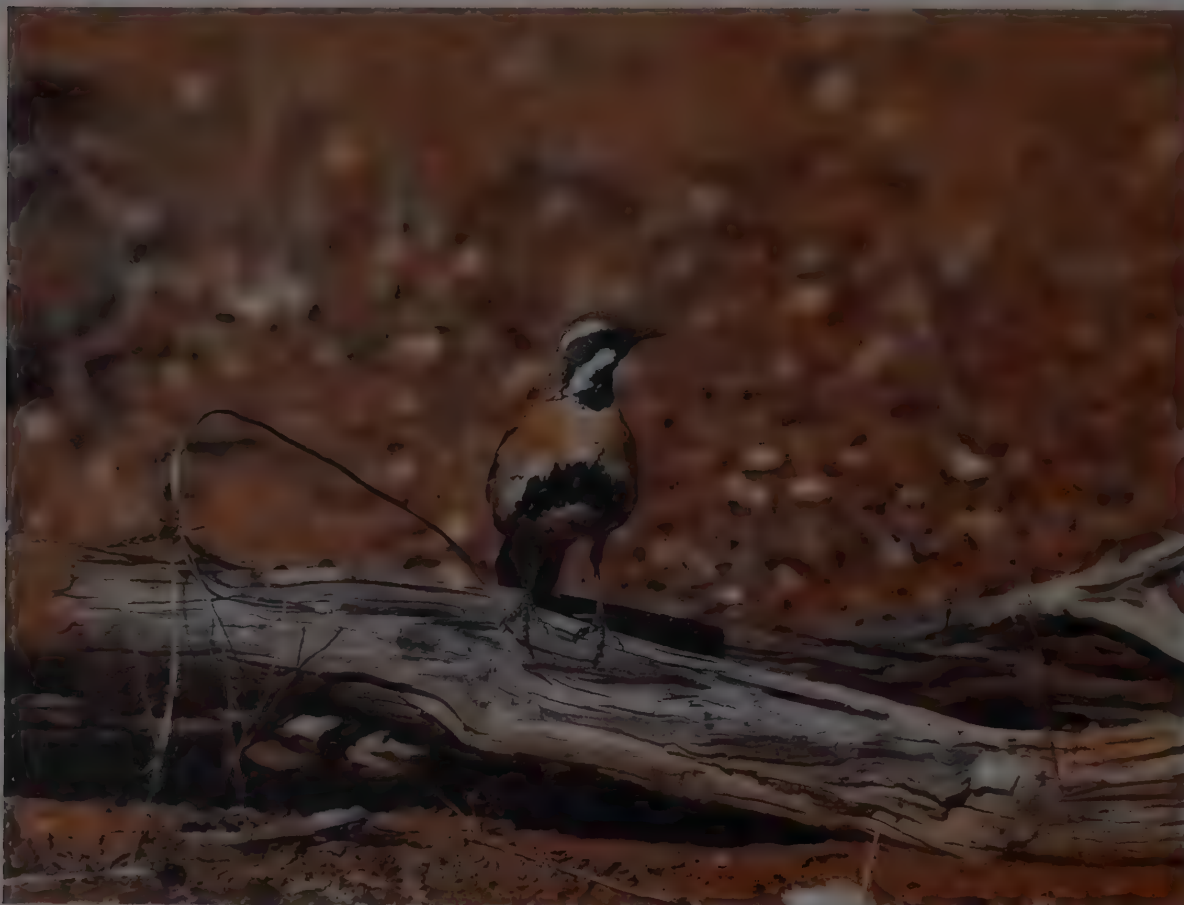
The Western Whipbird inhabits sites with a dense shrubby understorey 1.5–2 m high. Its four subspecies are found in two quite different habitats, contributing to the suggestion that this whipbird should be split into two species (see Systematics). In the south-western corner of Western Australia, the nominate race lives in heath-like thickets in the region of Two Peoples Bay. The other three subspecies, living mostly farther inland, reside in mallee woodland with heavy undergrowth, mallee being scrubland formed by low-growing multi-stemmed eucalypts. The whipbirds' congeners, the two wedgebills, live in a variety of

Occupying its own genus, the **Blue-capped Ifrit** is an unusual species endemic to the mossy montane forests of New Guinea. Although it is placed for convenience in Eupetidae, its true taxonomic affinities are unknown and it may actually belong in its own monotypic family. Creeping like a nuthatch (*Sitta*) up trunks and along branches, it is the only arboreal member of Eupetidae, and this characteristic is reflected in its relatively weak legs compared to the other, largely terrestrial, family members. For a eupetid, it also has a noticeably short tail, although it is not as stubby as that of the Lesser Melampitta (*Melampitta lugubris*).

[*Ifrita kowaldi kowaldi*,  
Huan Peninsula,  
NE New Guinea.  
Photo: William S. Peckover]







The quail-thrushes have the most complex plumage patterns in the family, being a potpourri of chestnut, brown, grey, black and white. The underparts tend to be boldly marked. The tone of the upperparts, however, usually matches that of the soil where the respective species lives, thus aiding camouflage. The need for some element of cryptic plumage may be heightened in ground-nesting female quail-thrushes, which tend to be responsible for incubation and brooding and thus need to avoid attracting the attention of predators. This may be the reason why quail-thrushes show such strong sexual dimorphism. This characteristic is illustrated in these two **Chestnut-breasted Quail-thrushes**. The male (above) is strikingly patterned, particularly on the underparts, which have black, white and chestnut bands of various widths; his head is also eye-catching, with its black mask and white supercilium. In contrast, the female (below) is a duller, more washed-out-looking bird, blending in more with her habitat of red-soiled dry woodland scrub.

[Above: *Cinclosoma castaneothorax marginatum*, Wanjarrri Nature Reserve, Western Australia, Australia.  
Photo: Graeme Chapman.

Below: *Cinclosoma castaneothorax castaneothorax*, Eulo, Queensland, Australia.  
Photo: Drew Fulton]





The Eupetidae occur in a wide range of habitats. Some inhabit tropical rainforest, particularly those of New Guinea; a few dwell in temperate woodland; and yet others in arid deserts. Also, the tropical species, especially the jewel-babblers, show notable altitudinal zonation. Given that the four quail-thrush species of Australia occur in arid scrubland, often on stony ground, the **Painted Quail-thrush** is something of an anomaly. Not only is it the sole member of its genus in New Guinea, but it is also the only one to inhabit tropical and monsoon forest and rainforest.

[*Cinclosoma ajax goldiei*,  
Varirata National Park,  
SE New Guinea.  
Photo: William S. Peckover]



semi-arid and arid habitats, such as low shrublands and low dense vegetation, in a range of situations.

Unlike the previous species, the Australian quail-thrushes favour areas with rather open, low vegetation. The Spotted Quail-thrush prefers dry sclerophyll forest with an open understorey, particularly on rocky hillsides, in temperate regions. The other three species occupy much drier areas. The Chestnut Quail-thrush is characteristic of mallee, although with much less undergrowth than that frequented by the Western Whipbird. The various populations of the Cinnamon and Chestnut-breasted Quail-thrushes more or less replace each other through arid and semi-arid regions. They are found on stony grounds and in sandy country, often with low cover or sometimes with dry woodland scrub. One form of the Cinnamon Quail-thrush, the subspecies *alisteri*, is largely restricted to the treeless shrubland of the Nullarbor Plain, which straddles the border between south-east Western Australia and south-west South Australia.

### General Habits

Most members of this family are rather shy, or, at least, cryptic, and some have a reputation for being particularly retiring. The Rail-babbler is notable for its timid attitude. So, too, is the Chiming Wedgebill (*Psophodes occidentalis*), one observer regarding it as the wariest of any Australian bird species. It remains concealed, rarely emerging from thick vegetation, except when it sings. As with many of these species, the wedgebill is heard much more often than seen. In the case of the Lesser Melampitta, the difficulty of observation may be due more to the thickness of the vegetation than to excessive shyness on the part of the bird itself. Like the Eastern Whipbird, the melampitta is inquisitive. Both of these species will often slowly approach a quiet human observer, thus providing the latter and the bird itself with a better view.

The majority of the Eupetidae are territorial throughout the year, and they respond to playbacks or imitations of their calls, thereby allowing views that are at other times rarely available. The Blue Jewel-babbler will circle an observer while making these calls, and watching from gaps in the cover.

In contrast to the other species, the Blue-capped Irit is not reclusive. It is seen in small parties, making little attempt at con-

cealment. It further differs from most of the family in not frequenting the ground, although it does sometimes descend to fallen logs. For most of the time, it moves about on the trunks and branches of moss-covered trees.

Quail-thrushes and jewel-babblers hold the body rather horizontal when they walk. They move the head forward and back as they go, in a manner reminiscent of that of pigeons (Columbidae), this action being accompanied by movements of the tail. In the case of the Blue Jewel-babbler, these exaggerated actions include holding the tail raised and partly spread or wagging it up and down. A similar pigeon-like motion of the head has been described for the Rail-babbler, which, while walking, holds its head up on its long neck, with the tail slightly lowered.

Both the wedgebills and the whipbirds spend more time in branches of the undergrowth than do the jewel-babblers or the quail-thrushes, but they do, nonetheless, pass a substantial proportion of time on the ground. They do not exhibit the pigeon-like head movements when on the ground, where they hop, rather than walk. They normally hold the tail elevated at a slight angle to the back, but, when adopting an alert posture on a perch, they hold the head and body lowered and the tail raised to a greater extent. The crest may be erected into an upright position; in the case of the wedgebills, it is curved slightly forwards. The appearance of the Papuan Whipbird in the field has been likened to that of a berrypecker (*Melanochoris*). This species holds the tail in a raised position and waves it in a lively manner.

In contrast to the above-mentioned species, the melampittas have a much more upright stance, somewhat like that of an Australasian robin (Petroicidae). The Lesser Melampitta also has the robin-like habit of occasionally perching sideways on a small sapling. It moves on the ground mainly by hopping, although it does at times run briefly and for short distances.

When chasing prey or if disturbed, the members of this family can move rapidly. The Rail-babbler has been described as resembling a rail (Rallidae) or a squirrel (Sciuridae) as it dashes over the ground and fallen branches, and the Greater Melampitta, rather than taking flight, moves up rock faces in the manner of a small mammal. When disturbed, quail-thrushes either stand stationary or burst into a whirring flight resembling that of a *Coturnix* quail. Upon alighting, they freeze or they run swiftly on foot to reach cover. Jewel-babblers, too, make low flights if startled, but





When walking, members of the genera *Ptilorhoa*, *Eupetes* and *Cinclosoma* hold their bodies horizontally. The long tail is often seen gently bobbing up and down, while the head nods back and forth as in pigeons (*Columbidae*). The **Blue Jewel-babbler** takes this a step further by holding the tail raised and partly spread or by vigorously wagging it up and down like a wagtail (*Motacilla*). It also uses its tail in display, of which two slightly different versions have been observed: the head is raised and the neck extended, while the tail feathers are either lifted, or lowered and spread.

[*Ptilorhoa caerulea* nigricrissus, Brown River, SE New Guinea. Photo: Brian J. Coates]

they are much more vocal than are the quail-thrushes, giving loud alarm calls as they make good their escape. The Rail-babbler, on the other hand, shows great reluctance to fly, even if disturbed, preferring to run to the shelter of cover. This behaviour extends to individuals that have been captured and handled: when released, they run, rather than fly, in order to escape.

The Chestnut Quail-thrush has been observed to make short dashes, stopping suddenly and raising its spread tail, before dashing off in another direction and repeating this sequence several times. It is uncertain what the function of this behaviour is, but it may assist in signalling to other birds or, possibly, in flushing insects. Similarly, wing-flicking performed by the Lesser Melampitta and the Blue Jewel-babbler may be used to scare hidden prey.

Only a few displays have been described for this family, and the context in which they are performed has not always been clear. A pair of Spotted Jewel-babblers, reacting to imitations of the species' call, erected the feathers of the crown while lowering and spreading the tail. This may have been an agitated response to the perceived presence of others of the species, because alarm notes were given at the same time. Two displays of the Blue Jewel-babbler have been observed, in both of which the head was raised and the neck extended. In one display the tail is lowered and spread, and the head and neck feathers are flattened, while in the other the tail is lifted and the neck feathers raised. Four Eastern Whipbirds observed as they chased each other probably represented two pairs, but the context of this interaction was not determined. More mysteriously, there is a single report of a lone individual of this species which was watched as it arranged leaves upside-down in a circle on the ground. It is extraordinary that this intriguing behaviour has not been reported subsequently.

The whipbirds, like most eupetids, maintain and defend territories against conspecifics throughout the year. The size of the Western Whipbird's territory appears to be related to the habitat in which it lives: in mallee it can be about 12 ha, whereas in coastal thickets it is substantially less, at 2.8–5.6 ha. There is considerable variation also in territory sizes of the Eastern Whipbird, which range from 0.4 ha to 12 ha. This species' territory overlaps with those of neighbouring pairs, even more so in the non-breeding season. Rivals engage in bouts of countersinging at a distance; should they meet along a disputed border, then chases ensue, escalating to physical combat, which sometimes results in the death of an individual.

The few Greater Melampittas that have been observed have been solitary. Most of the Eupetidae, however, are rather social, being encountered in pairs or small family groups in their territories throughout the year.

### Voice

These birds are more likely to be heard than they are to be seen. The majority of them are neither particularly poor songsters nor especially notable ones, but they do have distinctive voices, which

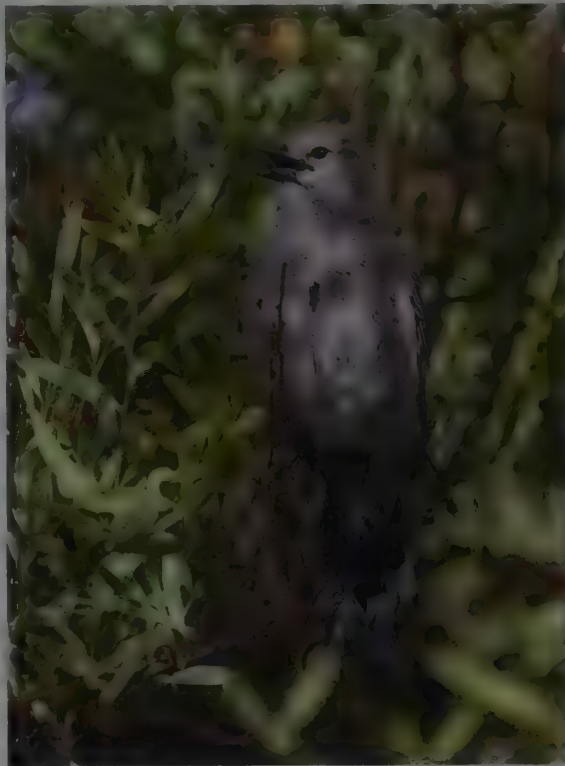


Unlike most members of this mainly shy and retiring family, the **Eastern Whipbird** is often bold and inquisitive. Such a confiding nature allows ornithologists to gain detailed insights into intimate aspects of the species' life cycle. Here, the male appears to be courtship-feeding the female, which he does shortly before her fertile period. During this important but risky time he guards her against other males, staying within a couple of metres of her at all times. The species maintains its pair-bond all year, and males defend their territory all year round. It is remarkable to note that resulting boundary disputes are occasionally fatal.

[*Psophodes olivaceus olivaceus*, Mt Glorious, SE Queensland, Australia. Photo: Brian J. Coates]

Voice is important for this family, most of whose members spend much of their lives on the ground in dense habitats. The distinctive voices of eupetids are often the first sign of their presence. This is certainly true of the **Chirruping Wedgebill**, which is one of the first songsters as dawn breaks in the Australian shrubland. This species is also an exponent of a practice common to several family members, namely antiphonal duetting. Throughout the day, the male Chirruping Wedgebill calls "chip chip cheroo", the first two notes soft and the last loud, to which his partner adds a loud "chirru".

[*Psophodes cristatus*,  
Port Augusta,  
South Australia.  
Photo: Peter Fuller]



are often the first indication of their presence. This is particularly so in the case of the terrestrial species inhabiting rainforest, which are reliant on this means of communication across their largely two-dimensional territories. The vocalizations are often loud and can carry for some distance, up to 800 m in the case of the Western Whipbird. In many localities in both New Guinea and Australia, the voices of these species represent one of the more characteristic components of the avian chorus. Not all of their vocalizations, however, are loud. Some phrases are subdued, this being particularly true of the open-country quail-thrushes. While their songs, given from an exposed perch, are not especially loud,

they do carry for some distance. The contact calls, in contrast, are thin, high-pitched and sibilant, and are undetectable to the ears of many human observers.

The Rail-babbler performs unusual posturing when vocalizing. It selects a vantage point on a fallen log, and then bends its legs, lowering its body until it almost touches the substrate. The head and neck are stretched forwards and the tail is raised and bobbed up and down. As the bird sings, it inflates an area of bare skin on the throat.

Perhaps the most striking vocal feature in this family involves the practice of antiphonal duetting, in which the male and the female of a pair each contribute different phrases, which go together to form the complete song. This has been recorded for the Painted Quail-thrush, the wedgebills and the Western Whipbird, but it is best documented for the Eastern Whipbird. As with the other duetting species, it is the male Eastern Whipbird that begins the song. He starts with 1–3 short, quiet notes, followed by a sound like that made by a whip passing through the air, this swishing sound, up to 2 seconds in duration, beginning quietly and then building in volume, reaching its peak at the end; he then gives a loud "whipcrack" note to finish. Immediately, the female responds with two sharp notes, "chew chew". Sometimes more than one female will answer, from different localities. Overall throughout the year, about 54% of songs are answered, but the rate at which females respond varies seasonally, reaching 87% at times. Perhaps to compensate for this, the male may add the final notes himself. The male's song is relatively constant across the species' range, whereas the notes uttered by the female show more marked geographical variation. The song of the Eastern Whipbird is one of the best-known bird vocalizations in eastern Australia. Many people recognize this sound without having ever seen the bird itself.

Although the contact calls of the Eupetidae are mostly brief and high-pitched, that of the Eastern Whipbird is a series of 5–9 harsh grating notes, and that of the Western Whipbird a clucking note. During foraging bouts, the Blue-capped Ifrit utters a "jitji-jit" call and the Lesser Melampitta gives a short, low tapping sound. The alarm calls of the quail-thrushes are rather harsh and grating, and those of the jewel-babblers are loud and often rasping. For example, the Spotted Jewel-babbler emits a squeaky rasp and a high-pitched note followed by a hiss when disturbed, in which situation the Chestnut-backed Jewel-babbler utters a series of loud "chewchew" notes. A frog-like "goink" made by the Rail-babbler possibly functions as an alarm call.

Most eupetids feed on the ground. Quail-thrushes and jewel-babblers meander slowly along the forest or scrubland floor, nosing about nooks, and tossing aside leaf litter with the bill. The **Chestnut-backed Jewel-babbler** is no exception, bobbing along the ground as it flicks over leaves and other ground detritus in its search for insects and possibly small frogs. Little is recorded about this genus, but one of its members is known to eat small fruits, and another flicks its wings when foraging to flush out insects. If disturbed while feeding, jewel-babblers make low flights to safety, uttering a loud alarm call.

[*Ptilorrhoa  
castanonota pulchra*,  
Sogeri Plateau,  
SE New Guinea.  
Photo: Brian J. Coates]







Although, like its congeners, the **Eastern Whipbird** forages in low vegetation and on trunks and branches, it feeds mainly on the ground. Making about six attacks per minute, it gleans or probes loose bark for insects and other small invertebrates such as spiders. It will also pick up and listen to small fruits, apparently straining to hear the sounds of insects moving within; it sometimes eats the fruit pulp. Eastern Whipbirds rarely join mixed-species flocks, tending to feed singly or in loose aggregations of up to four birds, a few metres apart.

[*Psophodes olivaceus olivaceus*, Mt Glorious, SE Queensland, Australia. Photos: Brian J. Coates]

### Food and Feeding

Most of the Eupetidae feed on the ground. Quail-thrushes and jewel-babblers walk slowly in a meandering fashion, peering into crannies, and shuffling or tossing aside ground litter. Whipbirds, too, forage on the ground, but in a more straightforward fashion. Typically, the members of this family use the bill, rather than the legs, for turning leaves and poking through the substrate. The whipbirds and wedgebills feed also in low vegetation, gleaning food items from the foliage and bark. The usual prey consists of arthropods, mainly insects, but small vertebrates such as frogs and lizards are taken by some species. Larger items are held down with the foot while being subdued and dismembered. In addition to animal food, seeds are sometimes taken, particularly by quail-thrushes, and in New Guinea the Spotted Jewel-babbler and the Lesser Melampitta are known to supplement the diet with small fruits. The Eastern Whipbird eats seeds, shoots and fruits of a variety of plants, as well as small invertebrates and, more rarely, reptiles and amphibians.

The only species that has been studied in any detail is the Eastern Whipbird. It forages mainly on the ground and in the lower vegetation layer, to 4 m above ground. In various studies, it has been found to feed among the leaf litter for 53–70% of the time, and to forage to a lesser, but sometimes substantial, extent on leaves, twigs and branches. For the remaining time, the whipbird searches in dead leaves, in vines and on tree trunks. It obtains about two-thirds of its food by gleaning from leaf litter and plant surfaces, and a further third by probing into loose bark or pulling it away from a branch. The Eastern Whipbird picks up small fruits, apparently in order to listen for insects inside; it also eats the fruit pulp.

Most disparate in its foraging behaviour is the Blue-capped Ifrit. Unlike the other members of the family, it does not feed on the ground. Instead, it searches for prey on fallen logs and on the trunks and branches of trees. The ifrit moves in manner resembling that of a nuthatch (Sittidae), slowly climbing on trunks and along branches, bracing itself with its tail as it hangs over the edge to search for food. It also readily joins mixed-species foraging flocks, an infrequent practice among the rest of the family.

### Breeding

The breeding biology of several species, particularly those of New Guinea, is largely unknown, and many aspects of the repro-

duction of others in the family are known from only one or two observations. Nothing has been recorded for either the Papuan Whipbird or the Painted Quail-thrush. The Australian species are better known, but there have not been any extensive studies of any of these birds. The most detailed information on breeding available is that for the Lesser Melampitta, the Eastern and Western Whipbirds and several of the Australian quail-thrushes.

As a result of the scant observations of nesting among New Guinea species, only general extrapolations can be made with regard to their breeding seasons. The Blue-capped Ifrit, the Lesser Melampitta and the jewel-babblers appear to start nesting in the middle to late part of the dry season, continuing into the wet season to varying extents. In Australia, the season generally be-



The breeding biology of several eupetids, particularly those from New Guinea, is very poorly known. However, of the members of the family for which data are available most, such as the **Eastern Whipbird**, construct a cup-like nest. The neat nest can be up to 20 cm in diameter and 10 cm in height. Constructed of twigs and stems, and lined with roots and grass, the nest is placed about a metre above ground and is usually hidden in thick cover. The female incubates up to three (but usually two) light blue eggs for 16–18 days, during which time she is fed by the male. Pairs normally raise two broods in a breeding season.

[*Psophodes olivaceus lateralis*, Atherton Tableland, N Queensland. Photo: Cliffrith & Dawn Frith]



Like many other passerines in arid areas, the four Australian quail-thrushes have been recorded breeding through much of the year. During droughts, however, they may not breed at all. This male **Spotted Quail-thrush** is more fortunate, as he brings an orthopteran to the nest, either to feed an incubating or brooding female, or to feed one of up to three chicks. The female alone will incubate for about 14 days, but both parents take responsibility for feeding the chicks. These fledge after some 14 days, but they cannot fly for several days more, during which time they return to the nest to roost at night.

[*Cinclosoma punctatum*.  
Photo: E. McNamara/Ardea]



gins in the second half of the winter, but its commencement and duration can vary geographically, more southerly populations often starting later than the northern ones. Arid-zone species are more variable, being dependent on local climatic conditions. The irregularity of rainfall in this region affects the timing of nesting. The Cinnamon Quail-thrush, as many other passerines in arid habitats, has been recorded as breeding in all months of the year. In times of drought, however, there may be no breeding attempts made at all. Several species may produce a second clutch if conditions permit, the Eastern Whipbird regularly doing so. Re-laying after the loss of a fresh clutch is also of common occurrence. In the case of the Chestnut Quail-thrush, the interval between loss and replacement is 12–14 days.

Most eupetids for which the relevant details are available construct a cup-like nest. Quail-thrushes make this from grass, leaves and bark, such vegetation reflecting the drier habitats in which these species live. The small, loosely built structure is placed in a shallow depression in the ground, usually near the base of a larger object such as a tree, shrub, log, rock or clump of grass. The closely related jewel-babblers also build their nests on the ground, but the plant material that they use, such as palm fronds, is more typical of the wetter habitats in which the members of this genus are found. The cup-nests of the whipbirds and wedgebills are neater than those of the quail-thrushes. They are placed in low vegetation, usually within a few metres of the ground, and often only a few centimetres above it.

The nest of the quail-thrushes is a loose, shallow cup of grass, bark and sticks, lined with grass, placed in a depression at the foot of vegetation, as here, or of a rock. This female **Cinnamon Quail-thrush** has probably just fed her one or two chicks with seeds, insects or spiders. Unusually for the genus, the eggs may have been partially incubated by the male. Should either parent feel that the nest is under threat from an intruder, it will distract the aggressor by feigning injury, running towards the intruder, wings drooped and tail spread.

[*Cinclosoma cinnamomeum tirariense*,  
Simpson Desert, Australia.  
Photo: Roger Brown/  
Auscape]







The remaining members of the family diverge from these rather generalized open cup-nests. The bowl-shaped nest of the Blue-capped Ifrit is a more robust structure, a bulky object with thick walls of green moss. Rather than being concealed under cover or in low, dense vegetation, it is placed about 3–5 m from the ground in a thin sapling. The Lesser Melampitta, too, uses green moss in its nest, but it weaves this material, together with smaller roots and dried fern fronds, into a dome with a side entrance. This structure is built several metres from the ground, on the side of a tree-fern trunk, to which the melampitta attaches it by weaving the nest material into the trunk, dead fronds and other adjacent vegetation. The nest of the Greater Melampitta is more mysterious. It has not been formally described, but the local people in the Fakfak Mountains, in west New Guinea, state that it is a large hanging basket made of vines. Even more intriguingly, it is allegedly built in a limestone sinkhole, below ground level.

Both the Lesser Melampitta and the Blue-capped Ifrit lay a single egg, which is white with a sprinkling of small dark spots and blotches. The clutches of the quail-thrushes, jewel-babblers and Rail-babbler consist each of two eggs, which are covered with dark spots and blotches against a paler background. Australian whipbirds and wedgebills have light blue eggs strongly marked with black scribbles; clutches of these species are usually of two eggs, but sometimes of one or three eggs.

Information on the roles of the parents at various stages of the breeding cycle is available only for the quail-thrushes, the whipbirds, the wedgebills and the Lesser Melampitta, and even for these it is often incomplete. The division of labour, when known, appears similar for all groups. The following details are a generalized summary, and some aspects have not been confirmed for all species. Construction of the nest is undertaken by the female. With few exceptions, she also carries out almost all of the incubation of the eggs; there is the occasional observation of the male Cinnamon Quail-thrush assisting with this task, while both sexes of the Chestnut-breasted Quail-thrush have been reported as incubating. In the case of the last-mentioned species, it is possible that co-operative breeding also occurs, as a young individual has been seen to assist at the nest; it has not been confirmed that this is a regular occurrence. Early observers noted

that the female Chestnut Quail-thrush sits so tightly when incubating that she may be touched or even picked up.

Characteristically in the Eupetidae, the incubating female is fed by the male, both on and off the nest, and she is also fed by her mate when she is brooding the nestlings, another duty which she performs unaided. Both parents, however, feed the nestlings and fledglings, this, incidentally, being the only aspect of breeding biology so far reported for the Spotted Jewel-babbler. If Western Whipbirds have two young, the parents divide the role of feeding, each caring for one of the chicks. Feeding of the fledglings continues for at least two months. From a taxonomic point of view, it is worth noting that, in contrast to the birds-of-paradise, Lesser Melampittas do not feed their nestlings by means of regurgitation.

Recorded incubation periods are about 14 days for the Spotted Quail-thrush, 16–18 days for the Eastern Whipbird, and 21 days for the Western Whipbird, with hatching success of 36–80%. For those species for which the relevant information is available, the chicks are covered with natal down when they hatch; again, for the Lesser Melampitta, this constitutes a difference from the birds-of-paradise. In the case of the Western Whipbird, the chick's eyes start to open by the second or third day and are fully open by day 6, while the pin-feathers begin to emerge during days 2–4. Young whipbirds leave the nest when they are 10–12 days old, at which stage they are fully feathered but unable to fly, although they run well and can scramble through the vegetation. The young quail-thrushes are equally incapable of flight when they leave, after a slightly longer period in the nest; for several nights after departure, they return to the nest in order to roost. The incubation periods of the two wedgebills are 14–17 days, but the duration of their nestling period is not known. In marked contrast, the Lesser Melampitta's incubation takes at least 27 days and the fledging period is close to 35 days. In the few studies conducted, the fledging success of the Eastern and Western Whipbirds, expressed as a percentage of hatchlings, was 22.7% and 54%, respectively.

If a predator approaches the nest or chicks of a pair of Eastern Whipbirds, the adults attempt to distract it by spreading the wings and tail and running back and forth in front of it. Alternatively, they may perform an injury-feigning display, fluttering about as if they have a broken wing. Spotted Quail-thrushes ei-

As with other family members for which data is available, nestling Eastern Whipbirds are covered with natal down upon hatching. The chick will stay in the nest for 10–13 days, then leave fully feathered but unable to fly. To escape danger, fledglings scramble quickly though the vegetation to safety, perhaps while one of their parents puts on a distraction display, fluttering around as if a wing were broken. Although less than a quarter of hatchlings will survive, those that do are precocious. Young males sing from five months old, form pairs a month later, and breed before they acquire adult plumage.

[*Psophodes olivaceus lateralis*,  
Atherton Tableland,  
N Queensland, Australia.  
Photo: Clifford &  
Dawn Frith]



Unlike the simple cup-shaped nests of most eupetids, the **Lesser Melampitta** makes a fairly elaborate dome-shaped nest with a side entrance. It is constructed from the live green moss typical of its preferred montane-forest habitat, and is interwoven with roots, tendrils and ferns, and lined with a thick cup of roots. The nest is sited a couple of metres above ground, tethered to the side of a large tree fern trunk and sometimes, as here, supported by thick stems. The red iris of the bird in the photograph indicates that it is male (females have brown irides). His role in raising offspring is to feed the incubating or brooding female, and, together with the female, to feed the single chick. Raising a chick is a lengthy process for this species relative to other eupetids, with incubation lasting 27 days and fledging 35 days. Breeding is timed so that the chick hatches at the start of the wet season; this means that eggs are usually laid between late September and early November. In contrast to this abundance of information on breeding Lesser Melampittas, the nest of the congeneric Greater Melampitta (*Melampitta gigantea*) is shrouded in mystery. The nest itself has never been seen by scientists, but local people in west New Guinea report it to be a large hanging vine basket built below ground level in a limestone sinkhole.

[*Melampitta lugubris longicauda*,  
Tari Gap,  
Papua New Guinea.  
Photo: Clifford &  
Dawn Frith]





ther circle the intruder at a distance of several metres or fly at it, with the wings and tail spread.

Young male Eastern Whipbirds start to sing when they are about five months of age. Soon after this, they leave their parents' territory. Immatures may form pairs when only six months old, and they can breed before acquiring adult plumage.

There are few data on longevity for the members of this family. In ringing studies, a Spotted Quail-thrush has been recaptured following a period of 4 years 8 months, a Chestnut-backed Jewel-babbler was retrapped after 8 years 1 month, and an Eastern Whipbird was still alive more than 12 years 3 months after it had first been ringed.

## Movements

No long-distance movements have been recorded for any of these species. Some of the eupetids inhabiting the Australian arid zone may exhibit local shifts in response to environmental conditions, although these are not well documented. Those of more temperate parts of the country appear to be resident throughout the year.

Little is known about the New Guinea species in this respect. A few recaptures of ringed individuals have indicated that there is little more than very local movements. None has been in excess of 10 km from where the bird was originally captured.

## Relationship with Man

Because most of the Eupetidae are cryptic, and thus not often observed, they are not well known, by sight at least. There are, however, several marked exceptions. The loud and characteristic voice of the Eastern Whipbird has made it a particularly well-

known bird throughout its range. The early European settlers in Australia gave it the nicknames of "Coachwhip" or "Stockwhip Bird", names which persisted well into the twentieth century. The prominent voice of the Chiming Wedgebill earned this species several colloquial names: "Chimes Bird" for its quality, "Waggon Bird" and "Wheelbarrow Bird" for its repetitious, rolling expression, and "Sweet Kitty Lintol" as an approximation of the cadence. This last character is apparent also in Aboriginal names for this species, such as *Wonbonalah* and *Chidadoo*.

Several local tribes in New Guinea, where many bird species are hunted for food, were well aware of the toxic quality of the Blue-capped Ifrit. The Kobon people of the Schrader Range, in the east-central part of the island, call the ifrit *Baibai* and note that it is unpalatable. Some regard it as more poisonous than the co-occurring Hooded Pitohui (*Pitohui dichrous*), in which the toxin in question was first reported. Among the Kalam people, *Slek-yakt*, the name given to this species, means "bitter bird" or "itchy bird"; if not properly prepared, by removal of the skin before eating, the Blue-capped Ifrit can cause burning of the mouth and lips. The anthropologist Ralph Bulmer found that there was disagreement over the reason for this poison, some informants believing that a diet of bitter fruits was responsible, while others disputed this on the grounds that the bird was entirely insectivorous. It has now been determined that the toxin originates from a type of beetle eaten by the ifrit. It is worth noting that these local observations were reported before the presence of a toxin in the tissues of this species was confirmed by chemical analysis.

## Status and Conservation

In 2000, BirdLife International, in its important publication *Threatened Birds of the World*, listed both the Rail-babbler and



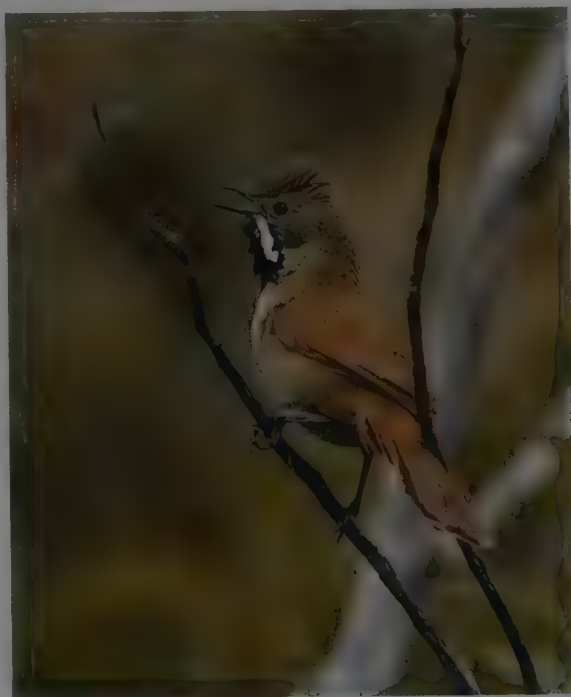
The bowl-shaped nest of the Blue-capped Ifrit is a robust and bulky structure, with thick walls of green roots, moss and leaf fronds, and a lining of fine tendrils or rootlets. Unlike other eupetids, which tend to do a good job of concealing their nests in dense vegetation, it places its nest in quite an exposed position, three or four metres up a thin sapling; such a nest location may reflect this species' arboreal nature. Like the Lesser Melampitta (*Melampitta lugubris*), the female Blue-capped Ifrit lays a single egg, and, also like that species, the egg is white with dark blotches. Unlike the Lesser Melampitta, however, there appears to be no fixed breeding period: there is evidence of breeding in both wet and dry seasons.

[*Ifrita kowaldi kowaldi*, Tari Gap, Papua New Guinea. Photo: Clifford & Dawn Frith]

While no member of Eupetidae is globally threatened, two are Near-threatened: the Rail-babbler (*Eupetes macrocerus*) of South-east Asian rainforests; and the Western Whipbird of Australia. Both have declined due to habitat loss and degradation and, in the case of the whipbird, changed fire regimes. The whipbird is a restricted-range species occurring in two Endemic Bird Areas. Its four subspecies, taken together, now number less than 20,000 mature individuals at just 20 or so sites.

[*Psophodes nigroregularis oberon*, Jerramungup, Western Australia; Australia.

Photo: Graeme Chapman]



the Western Whipbird as Near-threatened as a result of loss of habitat. Within the Rail-babbler's geographical range, which covers the Malay Peninsula, Sumatra and north Borneo, logging has been very extensive. Fortunately, this species prefers areas of slightly higher elevation than those where most of this has occurred. In addition, it has demonstrated an ability to persist in areas that have been logged.

Habitat loss and degradation have been responsible for the current status of the Western Whipbird, but its four populations have varied in the extent of their declines. On Australian criteria alone, the conservation status of these four subspecies ranges from "Near-threatened" to "Endangered", although the species is not in itself considered globally threatened. The eastern subspecies *leucogaster* is now restricted to five locations covering a combined area of less than 200 km<sup>2</sup>, and the estimated total of 2000 breeding-age individuals continues to decline. The mallee habitat occupied by *leucogaster* has been extensively cleared, causing most of the contraction in its range, but fire now poses the greatest threat to the remaining fragments. This subspecies is classified as "Endangered". Although the nominate race is currently listed as "Vulnerable", a case could be made for upgrading this to "Endangered". This race is restricted to heath-like thickets in south-west Western Australia, where its population of about 2500 individuals occupies an area of less than 300 km<sup>2</sup>, at only three locations, thus making it particularly susceptible to a large fire. Fire has been blamed for the loss of this species from some localities, and it has been the control of fire in the Two Peoples Bay area that has allowed the recovery of the Western Whipbird there. This has been aided by captive-breeding and the transfer of individuals into unoccupied areas. Recolonization of burnt areas can occur 4–10 years after the fire. The remaining two subspecies of the Western Whipbird are classed as "Near-threatened". Just to the north of the nominate race, the subspecies *oberon* numbers some 10,000 breeding individuals spread across twelve localities, the largest subpopulation consisting of 5000 birds; this race is believed to be declining. Finally, the subspecies *lashmari* is confined to Kangaroo Island, off South Australia, where its population of 5000 mature individuals is considered stable.

Still in Australia, the two subspecies of the Spotted Quail-thrush on the south-eastern mainland and Tasmania are widespread and secure, but that of the Mount Lofty Ranges, in South Australia, may have become extinct. There have been no published records of this last subspecies, *anachoreta*, since 1984. Should this population persist, it is probably restricted to a single small location. Habitat clearance, severe fires and probable in-

ability to recolonize remaining fragments are all likely to have contributed to its loss. It is of interest to point out that this Mount Lofty race was not formally described until 1999.

More than half of the habitat of the eastern, nominate race of the Chestnut Quail-thrush has been lost, for which reason the subspecies is listed in Australia as "Near-threatened". Although it appears to cope with grazing and fire, clearance of vegetation for agriculture has reduced and fragmented its habitat, and in some areas this process is continuing. This species is likely to disappear from smaller fragments.

Two other Australian quail-thrush populations have been flagged for ongoing monitoring. The eastern, nominate race of the Chestnut-breasted Quail-thrush and the Nullarbor Plain subspecies, *alisteri*, of the Cinnamon Quail-thrush have been identified as having undergone contraction in their geographical distributions owing to loss or degradation of habitat. Fortunately, both of these species remain relatively common in the remaining parts of their ranges. The Chestnut-breasted Quail-thrush does not exhibit any obvious adverse reaction to the presence of introduced predators, including foxes (*Vulpes*) and domestic cats, and it continues to survive in areas that are grazed by cattle and sheep.

Too little is known about the Papuan Whipbird for a proper assessment of its conservation status to be made. It is, therefore, currently listed by BirdLife International as Data-deficient. It is patchily distributed in the mountain forests of New Guinea, where it appears to exist at low population densities. The remoteness of much of this species' known range probably precludes any extensive human disturbance.

The remaining members of the family appear to be secure, at least for the moment, but several populations are possibly at risk, being restricted to relatively small areas at higher elevations, or are sparsely distributed. This is well illustrated by the Greater Melampitta, which occurs throughout montane New Guinea but is known from fewer than ten specimens. This species seems to be shy, and very local. Its apparent rarity, however, could be associated with its preference for forests on rugged limestone at elevations of 650–1400 m, an environment that is usually not visited by ornithological fieldworkers. Future work in these areas may reveal that the Greater Melampitta is more widespread than is presently thought.

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## Genus *EUPETES* Temminck, 1831

### 1. Rail-babbler

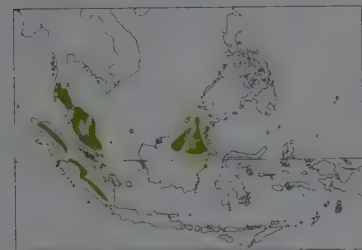
#### *Eupetes macrocerus*

French: Eupète à longue queue German: Rallenflöter Spanish: Zordala Colilarga  
Other common names: Malaysian Rail-babbler, Malay Scrub-robin

**Taxonomy.** *Eupetes macrocerus* Temminck, 1831, Padang, Sumatra. Relationships have long been highly disputed; species has traditionally been placed in Timaliidae, often but not always near other members of present family; recent study based on DNA sequences supports close relationship with anomalous African genera *Chaetops* (rockjumpers) and *Picathartes* (picathartes). Nomenclature confused: original name unjustifiably emended to "*macrocerus*" by Lesson in 1831, and this version has been used extensively; Temminck himself emended the name to "*macrocerus*" in 1835, and this name handwritten might have been misread and miscopied as "*macrocerus*" in original publication. Two subspecies recognized.

#### Subspecies and Distribution.

*E. m. macrocerus* Temminck, 1831 – S Thailand, Peninsular Malaysia and Sumatra.  
*E. m. borneensis* Robinson & Kloss, 1921 – N Borneo.



**Descriptive notes.** 28–30 cm; 66–72 g. Distinctive, with long neck and tail; broad white supercilium from front of eye and extending down side of neck, bordered below by broad black line from bill base and lores through and below orbit and along neck side, and azure patch on side of neck below black stripe. Nominative race has forehead rich ochraceous buff, crown, nape and hindneck chestnut-red, merging to reddish-brown on upperparts, uppertail-coverts slightly more intensely coloured; remiges dusky brown, edged golden-brown on outer webs, upperwing-coverts ochraceous buff, edged golden-brown; tail reddish-brown, rectrices edged more

ochraceous; chin, throat and foreneck rich chestnut, underparts ochraceous brown, breast lightly washed chestnut, belly washed grey; underwing-coverts reddish-brown; iris brown; bill and legs black. Sexes alike. Immature is duller than adult, forehead grey, throat white, underparts dark brownish-grey. Race *borneensis* differs from nominate in having head richer brown, upperparts, especially tail, much redder, underparts more extensively rufous. Voice. Song, usually starting with two or three soft clucks (detectable only at very close range), followed by thin monotone whistle increasing and then fading in volume, "oo...ooo...oooooooo...oo"; ventriloquial effect achieved by bird shifting between utterances. Presumed contact call "tok"; frog-like clucking "goink", possibly as alarm call.

**Habitat.** Tall primary forest and logged forest with closed canopy, layered structure and well-vegetated to fairly open floor; also swamp-forest and heath-forest. From lowlands to montane-forest ecotone, rarely into base of lower montane forest; to c. 1060 m in Malay Peninsula, and to 900 m in Sumatra and Borneo.

**Food and Feeding.** Insects, including cicadas (Cicadidae) and beetles (Coleoptera); also spiders (Araneae). Terrestrial; walks on forest floor, dashes over ground and fallen branches in pursuit of prey items. Timid. Reluctant to fly if disturbed, preferring to seek shelter by running.

**Breeding.** Eggs in late Jan or early Feb, and fledging seen in Jun. Nest a shallow, loosely constructed cup of plant fibres; one described as built c. 30 cm from ground, on top of accumulated dead leaves among leaf stalks of ground plant. Clutch 2 eggs, white and unmarked. No other information.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Scarce to fairly common over most of range; locally numerous. Rare in Taman Negara National Park, in Peninsular Malaysia. Marked shyness no doubt contributes to its apparent scarcity. Lowland habitat has been, and will continue to be, extensively logged throughout most of this species' range; it does, however, persist in logged forest. Forest on submontane slope more secure, although some doubt about long-term viability of fragmented populations.

**Bibliography.** Anon. (2006b), Butchart & Stattersfield (2004), Chasen (1939), Collar *et al.* (2001), Forbes (1882), Jonsson *et al.* (2007), King *et al.* (1975), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Robson (2000), Smythies & Davison (1999), Stattersfield & Capper (2000), Wells (2007).

## Genus *CINCLOSOMA* Vigors & Horsfield, 1827

### 2. Painted Quail-thrush

#### *Cinclosoma ajax*

French: Cinclosome ajax German: Ajaxflöter Spanish: Zordala Pintada  
Other common names: Ajax Quail-thrush/Scrub-robin, False Quail-thrush

**Taxonomy.** *Eupetes ajax* Temminck, 1836, Lobo, Irian Jaya, New Guinea.

Four subspecies recognized.

#### Subspecies and Distribution.

*C. a. ajax* (Temminck, 1836) – W New Guinea, from W & S coasts of Geelvink Bay S to Triton Bay and W Weyland Mis.

*C. a. muscile* Rand, 1940 – valley of upper R Fly (R Palmer and R Nomad S to Mt Bosavi), in EC New Guinea.

*C. a. alare* Mayr & Rand, 1935 – valleys of R Oriomo and lower R Fly, in S New Guinea.

*C. a. goldiei* (E. P. Ramsay, 1879) – SE New Guinea (Hall Sound E to Milne Bay).



**Descriptive notes.** c. 23 cm. Male nominate race is rusty brown above; side of head from lores to neck side black, broad white patch from base of lower mandible back to below ear-coverts and across side of throat to side of hindneck; remiges dark olive-brown, outer webs edged rusty brown, bases of primaries black, upperwing-coverts mostly black, outer primary coverts blackish-brown, lesser coverts rusty brown; central rectrices olive-brown, other rectrices black, outer two pairs broadly tipped white; chin, throat centre and upper breast black, breast side and flanks bright rufous-brown, centre of lower breast and belly

white and separated from flanks by broken black stripes; undertail-coverts white, some feathers tipped black; iris pale orange; bill black; legs pale pinkish. Female is smaller than male, has crown and upperparts olive-brown, side of head dark brown with long whitish supercilium duller in front of eye, feathers at bend of wing and primary coverts black with small white tips, chin and throat white, upper breast and flanks rich rufous-brown, centre of lower breast and belly off-white; iris rufous-brown. Immature resembles female, but iris paler. Race *muscile* is similar to nominate, but flanks paler, less bright; *alare* is like previous, but upperparts much paler; *goldiei* is like last but upperparts paler still, flanks brighter, female with reduced spotting in wing. Voice. Presumed advertising call is a drawn-out whistle, increasing in volume slowly before tailing off; a possible territorial call is a low-pitched whistle followed by loud upslur, "ooo-whit", repeated many times. Contact call a single, short, high-pitched insect-like "tk"; also gives rapid series of c. 7 disyllabic "whuish" notes, first syllable short and downslurred, second louder and upslurred. Sexes engage in duetting: male utters 1-2 explosive notes, female immediately follows with high-pitched descending whistle.

**Habitat.** Rainforest, monsoon forest and adjoining tall secondary growth, from near sea-level to c. 800 m.

**Food and Feeding.** Insects; probably also other small invertebrates. Terrestrial. Walks along unhurriedly, pauses to throw leaves aside; investigates likely nooks and crannies in and around roots and similar places.

**Breeding.** No information.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Papuan Lowlands EBA, South Papuan Lowlands EBA, Trans-Fly EBA and South-east Papuan Lowlands Secondary Area. Locally not uncommon, but generally thinly distributed and difficult to locate. Shy; reveals presence mostly by voice. Occurs in Varirata National Park.

**Bibliography.** Ames (1975), Bishop (1987), Coates (1990), Ford (1976, 1983a), Iredale (1956), Macdonald (1968b), Rand (1942a).

### 3. Spotted Quail-thrush

#### *Cinclosoma punctatum*

French: Cinclosome pointillé German: Fleckenflöter Spanish: Zordala Manchada  
Other common names: Spotted Ground-bird/Ground-thrush/Babbling-thrush/Ground-dove

**Taxonomy.** *Turdus punctatus* Shaw, 1794, New South Wales, Australia.

Three subspecies recognized.

#### Subspecies and Distribution.

*C. p. punctatum* (Shaw, 1794) – SE Australia, from SE Queensland S to Victoria and extreme SE South Australia.

*C. p. anachoreta* Schodde & Mason, 1999 – Mount Lofty Ranges, in SE South Australia.

*C. p. dovei* Mathews, 1912 – E Tasmania.



**Descriptive notes.** 24–30 cm; male 119 g, female 107 g. Male nominate race has long, narrow off-white supercilium from bill to nape side, black lores, black chin and throat and black moustachial stripe enclosing large rounded white patch on lower side of throat; ear-coverts and neck side light grey; forehead light grey, merging into olive-brown on crown to nape and hindneck, all with fine black streaking; upperparts olive-brown, bold black streak on each feather, uppertail-coverts somewhat paler and greyer; primaries and outer secondaries grey-brown, outer primaries edged pale grey-brown on outer webs, inner primaries

and secondaries edged light rufous-brown, innermost secondaries and tertials rufous-brown with heavy black central streaks; upperwing-coverts mostly black, alula and primary coverts broadly tipped white, greater secondary coverts tipped white (forming a narrow wingbar), innermost greater coverts rufous-olive with black centres, median and lesser coverts with small white spots at tips (forming broken rows); central pair of tail feathers light grey-olive, remaining rectrices sooty black with broad white tips; breast light grey, separated from white of belly by broken black band, breast side with thin black streaks; flanks, crissum and undertail-coverts light yellow-brown, black feather centres forming heavy streaks, becoming smaller spots posteriorly; iris grey-brown; bill black; legs pale pinkish-brown, feet mid-grey. Female is duller and paler than male, has supercilium somewhat duller, thin off-white eyering, lores much paler, large light rufous patch on side of lower throat, creamy malar area and chin, grey throat, shoulder patch light grey-brown, outer secondary coverts streaked black, breastband reduced or absent, belly more buff. Juvenile is mottled and scalloped with buff and dark sooty grey, upperwing-coverts grey-brown; immature resembles respective adult, young male may retain some contrasting juvenile primary or secondary coverts. Race *dovei* is very similar to nominate, but female has broken black line at lower edge of breast; *anachoreta* has smaller white tips on median coverts, with male slightly greyer on crown and nape. Voice. Song is a soft double whistle, "fee-oo", with second note higher, repeated 10–12 times in series. Contact

On following pages: 4. Chestnut Quail-thrush (*Cinclosoma castaneotum*); 5. Cinnamon Quail-thrush (*Cinclosoma cinnamomeum*); 6. Chestnut-breasted Quail-thrush (*Cinclosoma castaneothorax*); 7. Blue Jewel-babbler (*Ptilinopus caeruleus*); 8. Dimorphic Jewel-babbler (*Ptilinopus geislerorum*); 9. Spotted Jewel-babbler (*Ptilinopus leucostictus*); 10. Chestnut-backed Jewel-babbler (*Ptilinopus castanonota*).



call is a series of thin, very high-pitched "tseep" notes; slow grating notes uttered in alarm and distress.

**Habitat.** Dry open sclerophyll forest and woodland, particularly on rocky hillsides.

**Food and Feeding.** Feeds on insects, including beetles (Coleoptera), bugs (Hemiptera), orthopterans, flies (Diptera), hymenopterans and lepidopterans, occasionally takes small vertebrates, such as lizards; also seeds of several plant families. Exclusively terrestrial; turns over leaves and litter with the bill as it moves on slow, meandering course. Holds prey on ground with one foot in order to dismember it.

**Breeding.** Season Jul–Feb, later during that period in S parts of range; one, perhaps two, broods per season. Nest built by female, loosely constructed from dry grass, leaves and bark, lined with finer material, external diameter 10.2–12.7 cm, height 7.6 cm, internal diameter 7.6–8.9 cm, depth 3.8–4.4 cm, placed in depression in ground near base of tree, shrub, rock, or clump of grass. Clutch 2 eggs, occasionally 3, dull white with dark brown spots and blotches over lavender markings, average 33.9 × 23.6 mm; incubation by female, fed away from nest by male, incubation period c. 14 days; chicks fed by both parents, leave nest at c. 14 days, before capable of flight, return to nest for several nights thereafter; adults perform distraction display by circling intruder at 6–9 m, or threaten by spreading wings and tail and flying at intruder. Of nine eggs in one study, six hatched. Maximum recorded longevity 4 years 8 months.

**Movements.** Sedentary. Longest recorded movement of a ringed individual amounted to less than 10 km.

**Status and Conservation.** Not globally threatened. Nominat race and *dovei* generally sparse but locally common. Declines noted in some areas owing to modification or loss of habitat; will recolonize areas of logged forest where regrowth not too dense, in some places not until 25–35 years after logging. Race *anachoreta* considered fairly numerous in early 1900s, but rare by 1930s, and last published records in 1984; this race now at best "Critically Endangered", if not already extinct, owing to habitat clearance and fragmentation and to severe fire.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Campbell & Campbell (1926), Chisholm (1962), Condon (1962), Ford, H.A. & Howe (1980), Ford, J.R. (1976, 1983a), Garnett & Crowley (2000), Higgins & Peter (2002), Howe (1931), Hym (1953), Macdonald (1968b), North (1904), Schodde & Mason (1999).

## 4. Chestnut Quail-thrush

### *Cinclosoma castanotum*

**French:** Cinclosome marron **German:** Rotrückenflöter **Spanish:** Zordala Castaña  
**Other common names:** Chestnut-backed Quail-thrush, Chestnut Groundbird, Copperback

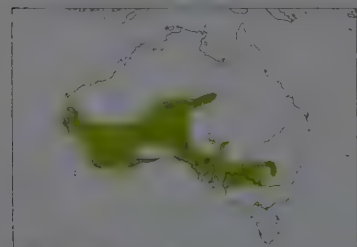
**Taxonomy.** [*Cinclosoma*] *castanotum* Gould, 1840, Belts of the Murray, South Australia, Australia. Described races *mayri* (from SC New South Wales) and *morgani* (from Eyre Peninsula, in South Australia) considered indistinguishable from nominate; *dundasi* (SW Western Australia) is an intergrade between *clarum* and *fordianum*. Three subspecies recognized.

#### Subspecies and Distribution.

*C. c. clarum* Morgan, 1926 – SC Western Australia, SW & SC Northern Territory and W South Australia.

*C. c. fordianum* Schodde & Mason, 1999 – S Western Australia and SW South Australia.

*C. c. castanotum* Gould, 1840 – SE South Australia, SW & C New South Wales and NW Victoria.



**Descriptive notes.** 21–26 cm; 73–83 g. Male nominate race has long narrow white supercilium from above lores back to side of nape, narrow black stripe from lores to side of throat, bordering white submoustachial stripe from lower mandible to throat side; crown, nape and ear-coverts brown, merging into grey on hindneck and side of neck; mantle, rump and uppertail-coverts grey-brown with indistinct fine black streaking, lower back and scapulars dark chestnut; remiges blackish-brown, narrowly edged light brown on outer webs, outer primaries with cream-white streak across bases, tertiaries with broad black central streak

and light rufous-brown edges; alula and most upwing-coverts black, prominently tipped white (white spots forming wingbars on folded wing), innermost greater coverts with broad black centres and light rufous-brown edges; central pair of tail feathers dark brown-grey, remaining rectrices black with broad white tips; chin and centre of throat to middle breast black, broken black line separating white of belly and crissum from light grey breast side and flanks, lower border of flanks washed with light rufous-brown; undertail-coverts white, boldly streaked black along side; iris dark reddish-brown; bill black; legs grey-black to mid-grey. Female is similar to male but duller, lacks black on face, has chestnut on upperparts reduced and paler, scapulars duller grey-brown, chin to breast light grey, whitish mottling on chin and upper throat, undertail-coverts creamy buff with dull brown streaking. Juvenile resembles female, but upperparts, throat, breast and flanks with dark brown mottling, immature male variable, some similar to adult male, others to adult female, some intermediate, breastband ranging from black with high grey patches to grey with blackish patches of various sizes; shoulder patch greyish-brown to darker brown, retained juvenile upwing-coverts contrasting with new black coverts; immature female as adult, but with retained juvenile secondary coverts. Race *fordianum* has chestnut band on upperparts wider, but not extending onto scapulars; *clarum* has chestnut band brighter and much more extensive, reaching to mantle, rump and scapulars. Voice: Song of tremulous, repetitive, monotone whistles, soft but carrying, sometimes blending into a trill. Contact call a high-pitched, piercing, insect-like "tseep"; alarm and distress calls consist of harsh notes, a puffing sound and sharp "kwit-kwit"; mouse-like squeak also given.

**Habitat.** Mallee with low scrubby undergrowth and other scrublands, e.g. acacia (*Acacia*) and eucalypt (*Eucalyptus*), in arid and semi-arid regions, usually on sand- or sandstone substrates.

**Food and Feeding.** Insects, particularly beetles (Coleoptera), bugs (Hemiptera) and orthopterans; also seeds; items usually 1–2 mm long, but up to 6–7 mm recorded. Forages on ground, following deliberate, meandering course, from time to time pecking with bill; will hold item under foot while pecking.

**Breeding.** Season Mar–Dec, in SE of range usually Aug–Dec, more variable in N, somewhat dependent on rains; may be double-brooded. Nest a cup of grass, leaves, bark and other dry vegetation lined with fine grass and bark, external diameter 9–12 cm, internal depth up to 7.6 cm, placed in depression in ground, usually at base of larger object such as shrub, clump of grass or log. Clutch 2 eggs, white or with faint greyish or bluish wash, blotched with lavender and spots of dark grey-brown, particularly at larger end, average 30.6 × 21.6 mm, with relay 12–14 after loss of fresh clutch; incubation by female, observed to sit for c. 69% of time, in bouts of 4–65 minutes

(mean 38 minutes), sits tightly and may be touched or even picked up by human observer, incubation period at least 10 days; chicks brooded by female, fed by both sexes, leave nest when at least 12 days old; fledglings fed by both adults, may remain with parents after becoming independent; parents perform distraction displays by circling intruder or by drooping wings and raising and fanning tail. Of nine eggs in five observed nests, eight hatched. Maximum recorded longevity of ringed individual at least 8 years 1 month.

**Movements.** Sedentary, but in more arid areas may be nomadic to varying extents; increase in numbers noted following periods of heavy rain. Longest recorded movement of ringed individual less than 10 km.

**Status and Conservation.** Not globally threatened. Locally fairly common; E populations (nominat race) considered "Near-threatened". Modification and loss of habitat, and grazing by livestock, have led to disappearance or fragmentation of local populations. Has been recorded as being absent for 1.5–2 years following fire or extensive habitat disturbance. Nominat race occurs in Wyperfeld National Park, in Victoria.

**Bibliography.** Barrett *et al.* (2003), Boehm (1964, 1981), Boles (1988), Campbell (1901), Campbell & Campbell (1926), Chandler (1913), Chisholm (1946), Condon (1951, 1962), Cowles (1974), Cracraft (1986), David & Gosselin (2002a), Ford (1970, 1974a, 1976, 1981b, 1983a), Garnett & Crowley (2000), Higgins & Peter (2002), Howe (1931), Johnstone & Storr (2004), Macdonald (1968b), McCarthy (2006), North (1904), Schodde & Mason (1999), Serventy & Whittell (1976), Smith *et al.* (1995), White (1913), Whitlock (1937), Woinarski (1989a).

## 5. Cinnamon Quail-thrush

### *Cinclosoma cinnamomeum*

**French:** Cinclosome cannelle **German:** Zimtflöter **Spanish:** Zordala Canela  
**Other common names:** Black-breasted Quail-thrush/Ground-bird/Ground-thrush; Nullarbor Quail-thrush (*alisteri*)

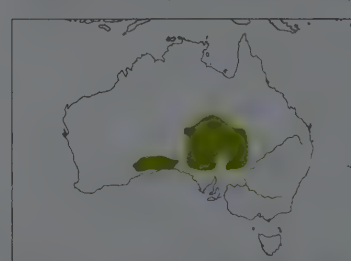
**Taxonomy.** *Cinclosoma cinnamomeum* Gould, 1846, north-western New South Wales, Australia. Race *alisteri* often regarded as a separate species, and in the past was sometimes treated as a race of *C. castaneothorax*; conversely, race *marginatum* of latter has sometimes been included within present species. Otherwise, race *tirariense* doubtfully separable from nominate, the two intergrading in a broad zone; described race *samuelli* (from South Australia) regarded as inseparable from nominate. Three subspecies currently recognized.

#### Subspecies and Distribution.

*C. c. tirariense* Schodde & Mason, 1999 – deserts of EC Australia (SE Northern Territory, NW South Australia, CW Queensland).

*C. c. cinnamomeum* Gould, 1846 – CS Northern Territory, N, C & CE South Australia, extreme SW Queensland and NW New South Wales.

*C. c. alisteri* Mathews, 1910 – Nullarbor Plain (SE Western Australia, SW South Australia).



**Descriptive notes.** 19–22 cm; 55–60 g. Male nominate race has black lores, narrow creamy supercilium extending from above lores to side of nape, brownish-grey ear-coverts; narrow black moustachial line continuing along side of neck, bordered below by broad white submoustachial stripe, latter accentuated by black chin and throat; rest of head and neck brownish-grey, crown washed light rufous-brown; upperparts rufous-brown, upper mantle washed light grey; remiges blackish-brown, narrowly edged rufous-brown on outer webs; alula and most of upwing-coverts black, tipped white (white wingbars visible both on

folded wing and in flight), inner greater coverts rufous-brown, narrowly streaked dull black; central pair of tail feathers rufous-brown, other rectrices blackish-brown with broad white tips; centre of breast white, grading to light cinnamon-rufous on breast side and flanks, narrow black band on lower breast, white below, black broken line extending from lower breast side back to side of undertail-coverts; iris red-brown; bill black; legs grey-black. Female differs from male in having lores greyish-brown, malar area buffy, wing-coverts duller and less contrasting (duller shoulder patch), chin and throat cream-buff, breast light brownish-grey, white submoustachial stripe absent, no black lateral stripe below. Juvenile is mottled on upperparts and underparts; immature as respective adult, but retains juvenile secondary coverts. Race *tirariense* male has upperparts, breastband and flanks paler, female has cream on throat more extensive, grey breast with stronger creamy tinge; *alisteri* male has crown, neck side and upperparts deep rufous-brown, supercilium shorter, breast entirely black (no white central band), female similar to nominate but breast somewhat darker and more sharply demarcated from pale belly, lower throat more mottled. Voice. Song apparently varies geographically, in C Australia (nominat race and *tirariense*) a series of notes on even pitch or on two pitches, in Nullarbor population (*alisteri*) a feeble repeated trill, "i-i-i-i-i". Contact call a high-pitched, insect-like whistle (C Australia) or "tsip-tsip-tsip" (*alisteri*); clucking notes as alarm call.

**Habitat.** Stony plains and tablelands with low scrub cover; less often on sandhills.

**Food and Feeding.** Diet made up chiefly of seeds, insects and spiders (Araneae). Forages on ground, walking slowly and deliberately on a meandering course, usually around base of shrubs. Uses bill to dig in sand.

**Breeding.** Recorded in all months in C Australia (nominat race and *tirariense*), May–Oct on Nullarbor (*alisteri*), timing possibly influenced by rainfall; probably double-brooded, but forgoes breeding in times of severe drought. Territorial. Nest a loose cup of grass, bark and sticks, lined with grass, external diameter 6.3–10.2 cm, internal diameter 7.6 cm and depth 3.2 cm, placed in depression in ground at base of tree, shrub or rock. Clutch 2 (sometimes 3) eggs in C Australia, usually 3 on Nullarbor, white or buffy white with olive-brown spots and freckles overlying lavender blotches, usually densest at larger end, average 28 × 20 mm; incubation by female, occasionally male; female and probably also male feed nestlings and fledglings; no information on duration of incubation and fledging periods; employs injury-feigning distraction display, may run towards intruders while holding wings drooped and tail spread.

**Movements.** Appears to be sedentary, with no evidence of large-scale movements; may make more local shifts depending on conditions, particularly on Nullarbor Plain.

**Status and Conservation.** Not globally threatened. Locally common in suitable habitat; uncommon on Nullarbor Plain (race *alisteri*). Has declined somewhat, possibly as a result of grazing by domestic livestock and introduced rabbits (*Oryctolagus*), combined with interactions of unpredictable rainfall and fire.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Brooker *et al.* (1979), Burbidge *et al.* (1987), Campbell (1901), Campbell & Campbell (1926), Condon (1962), Cowles (1974), Cracraft (1986), Ford (1970, 1974a, 1974b, 1976,



1979b, 1983a), Goodwin (1967), Higgins & Peter (2002), Howe (1931), Johnstone & Storr (2004), Macdonald (1968b), McCarthy (2006), McGill (1923), North (1904), Pedler & Burbidge (1995), Schodde & Mason (1999), Serventy & Whittell (1976), Whitlock (1922).

## 6. Chestnut-breasted Quail-thrush

### *Cinclosoma castaneothorax*

French: Cinclosome à poitrine cannelle

Spanish: Zordala Pechicastaña

German: Kastanienbrustflöter

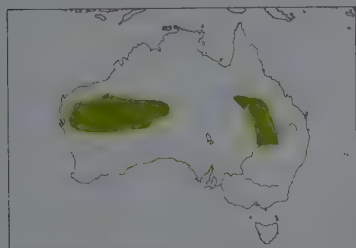
**Other common names:** Chestnut-breasted Ground-bird/Babbling-thrush; Black-vented Ground-thrush/Babbling-thrush, Western Ground-bird/Ground-thrush/Quail-thrush (*marginatum*)

**Taxonomy.** *Cinclosoma castaneothorax* Gould, 1849, Darling Downs, Queensland, Australia. In the past, race *marginatum* was sometimes treated within *C. cinnamomeum*, and race *alisteri* of latter has sometimes been regarded as a race of present species. Two subspecies currently recognized.

#### Subspecies and Distribution.

*C. c. marginatum* Sharpe, 1883 – C Western Australia, SW Northern Territory and extreme NW South Australia.

*C. c. castaneothorax* Gould, 1849 – E Australia from C Queensland S to CN New South Wales.



**Descriptive notes.** 21–25 cm; 55–75 g. Male nominate race has narrow creamy supercilium from above lores back to side of nape, glossy black lores, thin black moustachial line extending to throat side, bordered below by broad white submoustachial stripe from below base of lower mandible, stripe accentuated by glossy black chin and throat; rest of head and neck dark brown-grey, washed with light russet-brown; mantle and upper back dark brownish-grey, diffusely streaked with black, grading to rufous-brown on lower back to base of uppertail-coverts, distal tail-coverts brownish-grey, some scapulars rufous-brown; remiges

blackish-brown, narrowly edged light brown on outer webs, upperwing-coverts and alula glossy black, tipped white (forming lines on folded wing and in flight), inner greater coverts and tertials blackish-brown with narrow rufous-brown fringes; central pair of tail feathers blackish-brown, broadly edged rufous-brown, remaining rectrices black, broadly tipped white; broad rufous-brown band on breast merging with rufous-brown to light brown on flanks, narrow black band bordering breastband posteriorly and continuing along lower edge of flanks as narrow line of spots or short streaks; remainder of underparts white, undertail-coverts boldly streaked black; iris dark brown; bill black; legs grey to grey-black. Female is similar to male but less contrastingly patterned, has lores grey-brown with buff flecking, wing-coverts mostly dark brownish-grey, greater secondary coverts blackish with broad rufous-brown fringes, chin and throat creamy buff, breast light brown-grey, sides and flanks rufous-brown or light brown without black border. Juvenile is similar to female, but upperparts and underparts mottled; immature as respective adult, but retains some juvenile wing-coverts. Race *marginatum* is somewhat brighter than nominate, has rump, bases of uppertail-coverts and some scapulars uniformly rufous-brown, narrow supercilium not so extensive, rufous breastband separated from throat by narrow pale band and bordered posteriorly by narrow whitish band and then broader black band, latter continuing as border between rufous flanks and white belly. Voice. Song of nominate race a series of notes on same pitch, or with first sometimes higher, also 2 long and 3 short piping notes; *marginatum* a monotonous “i-i-i-i-e”, last note drawn out. Contact call a high-pitched “seep”.

**Habitat.** Dry woodland scrub, particularly mulga (*Acacia aneura*), with low understorey, on stony ground in semi-arid and arid zones.

**Food and Feeding.** Insects, spiders (Araneae) and seeds; most items 1–2 mm long, but some up to 6–7 mm. Forages on ground, walking slowly on meandering course, pecking with bill; holds larger items under foot while pecking to dismember them.

**Breeding.** Season variable. Clutches of nominate race started Jan–Oct (mainly Jul–Sept), of *marginatum* Jan–Sept; may attempt more than one brood if conditions permit, but does not breed at all in drought. Possible co-operative breeding recorded, with assistance by young (presumably from previous brood). Nest a loose bowl of grass, leaves and twigs, diameter 15 cm and depth 5 cm, placed in scrape on ground under shrub or tree. Clutch 2 eggs, rarely 3, white, blotched with lavender with dark brown overlying spots, average 29.1 × 23 mm; incubation by both sexes, but only female recorded as brooding and feeding nestlings; no information on duration of incubation and fledging periods.

**Movements.** No indication of large-scale or seasonal movements; some local dispersal associated with rainfall.

**Status and Conservation.** Not globally threatened. Common in W part of range (race *marginatum*); uncommon in E (nominate). Habitat modification and overgrazing are detrimental to this species. Nominant race requires ongoing monitoring, as extirpated from extreme E part of range, apparently by past clearance of habitat.

**Bibliography.** Barrett *et al.* (2003), Black & Walker (2006), Boles (1988), Brooker (1969), Campbell (1901), Campbell & Campbell (1926), Condon (1951, 1962, 1966a), Cracraft (1986), Ford (1970, 1974a, 1974b, 1976, 1979b, 1983a), Gamett & Crowley (2000), Higgins & Peter (2002), Johnstone & Storr (2004), Le Souëf (1908), Macdonald (1968b), McAllan (1995), McCarthy (2006), North (1904), Schodde & Mason (1999), Serventy & Whittell (1976), Smith *et al.* (1995).

## Genus PTILORRHOA J. L. Peters, 1940

### 7. Blue Jewel-babbler

#### *Ptilorrhoa caerulescens*

French: Ptilorrhoa bleu

German: Blauflöter

Spanish: Zordala Azul

**Other common names:** Lowland Jewel-babbler/Rail-babbler/Eupetes, Blue Scrub-thrush

**Taxonomy.** *Eupetes caerulescens* Temminck, 1836, Lobo, Irian Jaya, New Guinea.

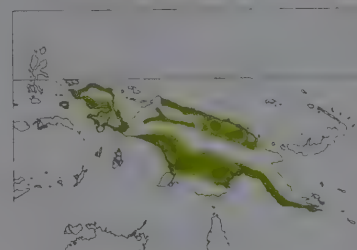
Often treated as conspecific with *P. geislerorum*, but the two show some altitudinal separation in area of co-existence in N New Guinea (near Madang); they also differ in behaviour, vocalizations and female plumage. Three subspecies recognized.

#### Subspecies and Distribution.

*P. c. caerulescens* (Temminck, 1836) – West Papuan Is (Salawati, Misool) and NW New Guinea (Vogelkop E to R Wanggar and Etna Bay).

*P. c. neumanni* (Mayr & Meyer de Schauensee, 1939) – N New Guinea from R Mamberamo E to Astrolabe Bay.

*P. c. nigricrissus* (Salvadori, 1876) – S New Guinea from R Wanggar and Etna Bay E to Milne Bay



**Descriptive notes.** 22 cm; 49–61 g. Male nominate race has entire body blue, except for white chin to upper breast bordered by black band from lores and broadly through and below orbit to neck side and across breast; remiges dark grey-black, inner primaries with bluish tinge on outer webs, secondaries entirely blue on outer webs; tail dusky brown, washed with blue, strongly so on outer webs; iris dark brown; bill and legs black. Female is similar to male but somewhat smaller, with white of throat extending to lower edge of eye. Juvenile is like female, but underparts browner. Race *neumanni* male is inseparable from nominate, female similar but black band from lores through ear-coverts extends below orbit; *nigricrissus* is similar, but undertail-coverts partly black, female with thin white supercilium. Voice. Song an extended series of strong whistles, descending or on even pitch, may end with loud, sharp “chit” or upsturred “swééit”; also a rising note followed by series of notes increasing in volume, “tsip fish-fish-fish-fish-fish-fish-fish-fish-fish”. Alarm and aggression call a repeated sharp “chóp”, followed by rapid “ti-ti-ti-ti”.

**Habitat.** Rainforest, monsoon forest, adjacent tall secondary growth and gallery forest; prefers damper localities. Lowlands and foothills to c. 300 m, above which replaced by *P. castanonota*, with little or no elevational overlap.

**Food and Feeding.** Insects. Forages on ground; uses bill to turn leaves, and probes in crevices. Flicks wings while feeding, probably to flush insects.

**Breeding.** Nests with eggs in mid-Sept and late Dec and fledglings in mid-Oct and mid-Nov, indicating breeding from middle of dry season to early wet season, at least. Territorial. Nest a deep cup of dead leaves and palm fronds, lined with fine rootlets, placed in depression on ground between buttressed roots or at base of small tree. Clutch 2 eggs, brownish-white, marked with fine grey-brown spots and streaks, and with dark brownish band around large end, 23.5 × 19.3 mm; no information on incubation and nestling periods. Longevity of ringed individuals more than 5 years 7 months.

**Movements.** Sedentary. Ringed individuals repeatedly recaptured at same site over several years.

**Status and Conservation.** Not globally threatened. Generally common. Population density near R Brown (SE New Guinea) estimated at 18 birds/10 ha.

**Bibliography.** Bell (1977, 1982b), Coates (1990), David & Gosselin (2002a), Iredale (1956), Mayr & Meyer de Schauensee (1939b), Ogilvie-Grant (1915), Peters (1940), Rand (1942a), Rothschild (1931).

## 8. Dimorphic Jewel-babbler

### *Ptilorrhoa geislerorum*

French: Ptilorrhoa des Geisler

German: Braunnackenfloher

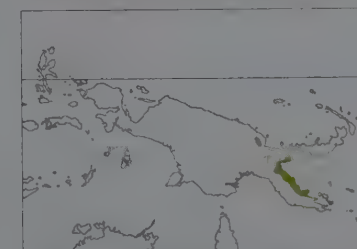
Spanish: Zordala de los Geisler

**Other common names:** Brown-capped Jewel-babbler

**Taxonomy.** *Eupetes geislerorum* A. B. Meyer, 1892, Butaueng, north-east New Guinea.

Conventionally considered conspecific with *P. caerulescens*, but the two are separated altitudinally where they occur together in N New Guinea (inland from Madang); they also differ in behaviour, vocalizations and female plumage. Monotypic.

**Distribution.** NE New Guinea from Adelbert Mts E to Collingwood Bay.



**Descriptive notes.** 22–23 cm. Male has crown dull greyish-brown with bluish tinge, browner on nape, rest of upperparts rich blue; lores black, broad black band through and below orbit to side of neck; individuals in Garaina area have thin blue supercilium from forehead to side of neck; remiges dark grey-black, inner primaries with bluish tinge on outer webs, secondaries entirely blue on outer webs; tail dusky brown, washed with blue, strongly so on outer webs, throat white, bordered by black band extending from neck side and across lower throat; underparts rich blue, undertail-coverts occasionally spotted white; iris dark brown; bill black; legs

dark grey-brown. Female is like male in pattern, but crown and back dusky brown or brownish-olive, rump rich deep chestnut, supercilium buffy brown, tail rich deep chestnut, lower breast through undertail-coverts and flanks deep chestnut. Immature male is like adult female, but supercilium white and indistinct. Voice. Song a long series of whistled bell-like notes, starting short and faint, becoming longer, louder and higher-pitched; also 6–50 or more rapid, short, low whistles and a loud 3-note phrase “tou tou-wheree”, sometimes followed by faint, high-pitched notes that become louder and lower, “tsi-sui-sui-suee suee-suee”. Alarm call rapid, loud whistles, “chuchuchuchu”; probable agonistic call a pair of explosive downslurs, “tsew-tsew”; other calls include loud, rising whistle.

**Habitat.** Forest in lowlands and hills, mainly to 700–800 m; to at least 1220 m in Adelbert Mts, where co-exists with *P. castanonota* (at 800–1220 m).

**Food and Feeding.** Insects and other small animals, including frogs. Terrestrial forager; walks along on ground while tossing leaves aside.

**Breeding.** Territorial. No data on nest and clutch size; eggs clay-yellow to reddish-grey with smudged yellowish-grey and grey-brownish spots, and strong grey-black spots, concentrated at broad end, size 31.6 × 23.4 mm. No other information.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Fairly common to common, but quite shy; heard far more often than seen.

**Bibliography.** Coates (1990), Cracraft & LeCroy (1987b), Greenway (1933), Iredale (1956), Schodde & Mason (1974), Weston (1975).



## 9. Spotted Jewel-babbler

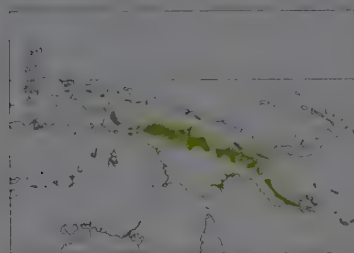
### *Ptilorrhoa leucosticta*

**French:** *Ptilorrhoa tacheté* **German:** Bergwaldflöter **Spanish:** Zordala Moteada  
**Other common names:** High-mountain Eupetes/Rail-babbler, Mountain Scrub-robin, White-spotted Scrub-thrush

**Taxonomy.** *Eupetes leucostictus* P. L. Selater, 1874, Hatani, Arfak Mountains, Irian Jaya, New Guinea. Seven subspecies recognized.

#### Subspecies and Distribution.

- P. l. leucosticta* (P. L. Selater, 1874) – mountains of the Vogelkop, in NW New Guinea.  
*P. l. mayri* (E. J. O. Hartert, 1930) – Wandammen Mts, S of Geelvink Bay (NW New Guinea).  
*P. l. centralis* (Mayr, 1936) – Weyland Mts, Nassau Range and Oranje Range, E possibly to Star Mts (WC New Guinea).  
*P. l. sibilans* (Mayr, 1931) – Cyclops Mts, on N coast of New Guinea.  
*P. l. menawa* (Diamond, 1969) – Bewani Mts (Mt Menawa), in C North Coastal Range of New Guinea.  
*P. l. amabilis* (Mayr, 1931) – Saruwaged Mts, in Huon Peninsula (NE New Guinea).  
*P. l. lorae* (Salvadori, 1896) – Mt Hagen and Schraderberg E through mountains of SE New Guinea.



**Descriptive notes.** 20 cm; 49–51 g. Nominate race has crown and nape dark chestnut, lores and chin black; narrow black stripe down centre of throat, broadening on upper breast into triangular black patch finely spotted with white; side of throat and neck side below eye white; upperparts dull olive-green, remiges dark brownish-olive, primary coverts dull olive-green; median and greater upperwing-coverts black, tipped white (forming double row of rounded white spots on folded wing); tail olive-brown, outer two feather pairs black with broad white tips; underparts dull ashy blue; iris dark brown; bill black; legs brown to light

brown. Sexes alike. Juvenile is brown, washed with rufous-olive, paler on underparts, has upperwing-coverts tipped pale rufous. Race *mayri* is similar to nominate, but back chestnut, and spotting on upper breast reduced; *centralis* is like previous, but breast greenish-olive; *amabilis* resembles nominate, but underparts mostly blue; *lorae* lacks spots on black upper breast, has breast and flanks dull greenish, belly blue; *sibilans* is similar to last, but crown brighter chestnut and breast with distinct olive-green band; *menawa* is also similar, but underparts extensively washed olive, covering most of breast and flanks, crown sometimes darker, back brighter. Voice. Song a level series of 7–30 short, low, bell-like whistles. Alarm call a squeaky rasping and high-pitched note followed by hissing; other calls include faint “tsip” and single or several rather explosive notes.

**Habitat.** Mountain forest at c. 1200–2700 m; overlaps with *P. castanonota* at 1200–1450 m.

**Food and Feeding.** Insects and other small invertebrates, also small frogs; occasionally small fruit. Terrestrial; forages by turning over leaves while walking along on ground.

**Breeding.** Nests with eggs in late Sept and mid-Oct and nestlings in mid-Aug and early Oct, indicating breeding during latter half of dry season, at least. Nest a cup-shaped structure of hair-like rootlets, moss and old leaves, lined with leaf skeletons, built on foundation of sticks, ferns and dead leaves; placed 60–90 cm above ground in base of tree or tree-fern. Clutch 2 eggs, pinkish-buff, rich pink or light brown, zone of russet spots and blotches at larger end, sparsely spotted over remainder, size 27.4–31.7 × 21–23.4 mm; no information on incubation period; nestlings fed by both parents, up to 11 feeding visits per hour; no information on duration of nestling period.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Not uncommon, but infrequently seen.

**Bibliography.** Beehler (1978b), Coates (1990), Diamond (1969, 1972), Harrison & Frith (1970), Hartert (1930), Iredale (1956), Mayr & Gilliard (1954), Sims (1956).

## 10. Chestnut-backed Jewel-babbler

### *Ptilorrhoa castanonota*

**French:** *Ptilorrhoa à dos roux* **German:** Buntflöter **Spanish:** Zordala Dorsicastaña

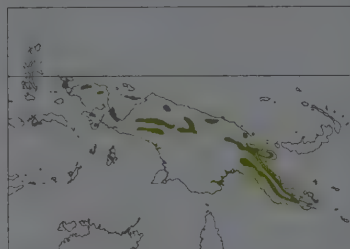
**Other common names:** Mid-mountain Eupetes/Jewel-babbler/Rail-babbler, Chestnut-backed Scrub-thrush

**Taxonomy.** *Eupetes castanonotus* Salvadori, 1876, Mount Morait, Vogelkop, New Guinea.

Several recently discovered populations represented by extremely few, if any, specimens; thus, racial identity of those on Yapen I and others in Wandammen Mts, Bomberai Peninsula (Fakfak Mts, Kumawa Mts) and Gauttier Mts (near W part of N coast) undetermined. Seven subspecies currently recognized.

#### Subspecies and Distribution.

- P. c. gilliardi* (Greenway, 1966) – Batanta I, in NW New Guinea.  
*P. c. castanonota* (Salvadori, 1876) – Vogelkop (Tannu Mts, Arfak Mts), in NW New Guinea.  
*P. c. saturata* (Rothschild & E. J. O. Hartert, 1911) – Nassau Mts, in WC New Guinea.  
*P. c. uropygialis* (Rand, 1940) – N slopes of Oranje Mts and C North Coastal Range (Torricelli Mts), in WC & N New Guinea.  
*P. c. buergersi* (Mayr, 1931) – NE New Guinea (Sepik Mts, Adelbert Mts, probably also W Finisterre Mts).  
*P. c. par* (Meise, 1930) – Saruwaged Mts, in Huon Peninsula (NE New Guinea).  
*P. c. pulchra* (Sharpe, 1882) – mountains of SE New Guinea (from Herzog Mts and Mt Karimui E to E Owen Stanley Range).



**Descriptive notes.** 22–24 cm; 70–74 g. Male nominate race has broad blue supercilium from side of forehead to posterior ear-coverts and neck side, black on lores and as broad stripe through orbit to ear-coverts, and continuing as black border of white chin and throat; forehead blue, crown reddish-brown, mantle and upper back chestnut, remainder of upperparts blue; remiges dark grey-black, inner primaries with bluish tinge on outer webs, secondaries entirely blue on outer webs; tail blue; underparts blue, undertail-coverts tipped black; iris dark brown; bill black; legs dark grey-brown. Female is similar to male, but upperparts to

uppertail-coverts chestnut, blue supercilium narrower. Juvenile is mainly dull brown, with white throat. Race *gilliardi* male resembles nominate, female is darker, crown almost black, back more olivaceous, underparts duller, feathers of lower belly tipped white; *saturata* is similar to nominate, but back much darker and underparts washed with purple; *buergersi* is similar to previous, but upperparts brighter and underparts paler; *par* is also similar, but anterior edge of mantle brighter chestnut, female with whitish to pale blue supercilium; *pulchra* is larger, with duller crown, female has creamy supercilium and black undertail-coverts with white tips; *uropygialis* has supercilium blue, female with lower back blue. Voice. Song 1–4 thin whistles followed by long whistle and then downslur or rapid high-pitched increasingly loud whistles, then sometimes 6 loud downslurs, “chuchuchuchughu”; also rising series of whistles and short high-pitched buzzy notes. Alarm a series of loud, often paired notes, “chewchew chewchew”.

**Habitat.** Inhabits hill and lower montane forest, at c. 300–1450 m; present up to 1580 m near Telefomin.

**Food and Feeding.** Insects; possibly also small frogs. Forages on ground, using the bill to turn over leaves.

**Breeding.** Females in breeding condition in late Jul and Aug, eggs in mid-Jun and immature in May, indicating breeding during dry season and probably also in early wet season, at least. Nest a shallow open cup made of old leaves and leaf skeletons, lined with very fine tendril-like rootlets. Clutch 1 or 2 eggs, light pinkish-buff or yellowish-white, with dark russet and grey spots and blotches or brown-yellow spots overlain with sooty-black ones (markings may be concentrated around larger end or distributed across entire shell), size 28.3–29.4 × 21.6–22.7 mm. No other information.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Considered to be generally fairly common to common, but is rather shy and as a result is heard far more often than it is seen. Occurs in Varirata National Park.

**Bibliography.** Beehler (1978b), Coates (1990), Diamond (1972, 1985), Frith (1971a), Gilliard & LeCroy (1967b), Greenway (1935, 1966), Iredale (1956), Rand (1940b), Rothschild & Hartert (1903b), Schönwetter & Meise (1974, 1977), Weston (1975).







PLATE 30

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10

## PLATE 30

## Family EUPETIDAE (JEWEL-BABBLERS AND ALLIES) SPECIES ACCOUNTS

### Genus *ANDROPHOBUS*

E. J. O. Hartert & Paludan, 1934

#### 11. Papuan Whipbird

*Androphobus viridis*

French: Androphobe vert

German: Grünrückenflötler

Spanish: Zordala Papú

Other common names: Green-backed Babbler

**Taxonomy.** *Androphobus viridis* Rothschild and E. J. O. Hartert, 1911, Mount Goliath, Orange Range, Province of New Guinea.  
Monotypic

**Distribution.** Mountains of C New Guinea: Weyland Mts, Nassau Range (L Habbema-R Ibele region), Oranje Range (Mt Goliath) and Southern Highlands Province (Tari Gap).



**Descriptive notes.** 16.5 cm. Male has top of head and upperparts dark green, side of head black, white malar streak; remiges dusky grey, upperwing-coverts dark green, tail dark green, chin, throat and breast black, breast side and flanks green, belly grey; iris dark brown; bill and feet grey-black. Female is similar to male, but side of head green, malar streak absent, throat and centre of breast grey, as belly. Immature is like female, but duller green upperparts with many feathers tipped black, underparts dull blackish, tinged greenish on sides. Voice: No information.

**Habitat.** Mountain forest at 1400-2800 m.

**Food and Feeding.** Insects and other arthropods. Feeds on ground or branch in contact with ground.

**Breeding.** No information.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Data-deficient. Restricted-range species; present in Central Papuan Mountains EBA. Very poorly known; apparently rare, but this is perhaps a reflection of the marked lack of information about this species. Remoteness of its habitat should assist in protecting it from deleterious human actions.

**Bibliography.** Anon. (2006b), Butchart & Stattersfield (2004), Coates (1990), Collar *et al.* (2001), Hartert *et al.* (1936), Hicks (1990, 1992), Rand (1942b), Ripley (1964a), Stattersfield & Capper (2000).

## Genus *PSOPHODES* Vigors & Horsfield, 1827

### 12. Eastern Whipbird

#### *Psophodes olivaceus*

**French:** Psophode à tête noire

**German:** Schwarzkopf-Wippflöter

**Spanish:** Zordala Crestada Oriental

**Other common names:** Whipbird, Coachwhip Bird, Stockwhip Bird

**Taxonomy.** *C[orvus]. olivaceus* Latham, 1801, New South Wales, Australia.

Proposed race *magnirostris* (from Rockhampton district of CE Queensland) considered inseparable from nominate. Two subspecies recognized.

**Subspecies and Distribution.**

*P. o. lateralis* North, 1897 – NE Queensland (Cairns and Atherton Tableland region), in NE Australia.

*P. o. olivaceus* (Latham, 1801) – CE Queensland (from Clarke Range) S to SE Victoria.

**Descriptive notes.** 25–30 cm; male 60–75 g, female 48–64 g. Nominative race has head and triangular erectile crest black, grading to olive-brown on nape; broad white patch from base of bill through malar region and on to sides of chin, throat and neck; upperparts dark olive-green, somewhat brighter on uppertail-coverts; remiges and most upwing-coverts medium olive-green on outer web, brown on inner web, primary coverts and alula brown; tail dark olive-green basally, grading to dark brown distally, all except central pair of rectrices with pale tip (tip diffusely white or buff inwards, becoming larger and better-defined white outwards); chin, throat and upper breast black, sides washed olive, remaining underparts olive-brown, centre of belly mottled off-white; iris dull reddish-brown; bill black; legs rufous-brown to black. Sexes similar. Juvenile has slight crest, is dull olive-brown, wings and tail washed with olive-green; immature similar to adult, but black areas of plumage replaced with dull olive-green, cheek patch paler and smaller, underparts paler and more mottled, iris brown, bill dark grey. Race *lateralis* is somewhat brighter on upperparts than nominate, and has shorter wing and tail. Voice. Song, given at relatively constant rate throughout year, most often in early morning, then sporadically throughout day (increasing in evening), a tightly co-ordinated antiphonal duet between sexes, audible beyond 400 m, in three basic parts, first (“Introduction”) male gives 1–3 short, quiet notes and then a sound like whip swishing through air (up to 2 seconds long), starting almost silently and gradually increasing in intensity until peak near end, then (“Whipcrack”) male utters loud, explosive crack, slightly overlapping end of previous note and can sound like two sources, whereafter (“Response”) female immediately adds sharp, rising, moderately loud “chew chew” or “chew chew”; female does not always respond over year (peak response in May, 87%), and male may add finishing notes; song, particularly introduction, is ventriloquial, and singer may change frequencies between individual songs. Contact call 5–9 harsh, grating notes; aggressive call a series of harsher notes; nest-approach call of male like introduction to antiphonal song, that of female 3–4 high-pitched notes. Mimicry of range of species recorded.

**Habitat.** Dense undergrowth in rainforest, wet eucalypt (*Eucalyptus*) forest and riverine vegetation, particularly in gulleys, and other low, dense vegetation; occasionally in other forest types, e.g. exotic pine (*Pinus*) plantations, with sufficient thick undergrowth. Sea-level to 1500 m.

**Food and Feeding.** Insects and other small invertebrates, i.e. spiders (Araneae) and millipedes (Diplopoda); rarely, small lizards and frogs; also seeds, shoots and fruits of variety of plants. Feeds either singly or in loose group of up to four individuals, several metres apart; rarely joins mixed-species foraging flocks, but will attend foraging Australian Logrunner (*Orthonyx temminckii*). Forages on ground in soil and leaf litter and low vegetation, to smaller extent on tree trunks and branches and in foliage; in various studies, 15–66% of foraging on ground, 12–58% in herb layer and shrub layer (below 4 m), 4–12% in understorey and subcanopy (4–10 m), and 0–4% in lower canopy (above 10 m). Foraging substrates include leaf litter (53–70% of foraging attempts), small leaves, twigs and branches (8–32%), tree trunks (6–10%), dense bunches of dead leaves (8%), and tangles of vines and dead vegetation (4%); searches among loose bark. Uses bill to turn leaves and debris; feet employed only rarely. Most food caught by gleaning (65%), also by probing or pulling loose bark (34%); rarely sallies for items (2%). Makes about six attacks per minute; moves with hops, or in short flights of 1–5 m. Apparently inspects small fruits for insects contained within; picks fruit in bill, places it beneath foot, listens, and then either drops the fruit and moves to another one or, if insect present, pecks it apart. Will pick up seed in bill, sit back on tail and ankle joint (such that belly and tail flat on ground), and then transfer seed to its foot and eat the pulp.

**Breeding.** Season Jul–Nov in NE Queensland, Jul–Feb (peak Sep–Oct) and fledglings until Mar in New South Wales, and Sept–Oct in Victoria; usually two broods in a season. Apparently monogamous, maintaining pair-bond throughout year. Territorial, territory defended all year, boundaries overlap somewhat with those of neighbours (more so in non-breeding season), male guards female during fertile period, staying within 2 m, encounters involve chases, sometimes fights (occasionally fatal), aggression greatest before and during breeding season. Male courtship-feeds female before fertile period. Nest a neat cup of twigs, sticks, stems, grass and rootlets, lined with roots, rootlets and dry grass, external diameter usually c. 15 cm (up to 20 cm), height 5–10 cm, internal

diameter 7.5–8 cm, depth 3–5 cm; placed 0.3–3 m (mean c. 1 m) above ground in dense low plant, fork or centre of vegetation, second-brood nest built close to first; depending on site and habitat, territory size varies from 0.4–1.2 ha to as large as 9 ha. Clutch 1–3 eggs, usually 2, light blue with black or light grey spots, blotches and wavy lines, average 27 × 19.4 mm; incubation by female, fed on and off nest by male, period 16–18 days, occasionally longer; chicks brooded by female, fed by both sexes, nestling period 10–13 days; young often leave nest before able to fly, they run and scramble well in vegetation; with broods of two young, each adult cares for one; during nesting cycle, adults give distraction display, with spread wings and tail, running back and forth while giving distress calls or performing injury-feigning display (broken-wing act); young male becomes vocal at c. 5 months, leaves natal territory soon thereafter. Hatching success 36–74%, and in one study fledging success 22–7% (0.42 fledged young per nest); predators include monitor lizards (*Varanus*), Laughing Kookaburra (*Dacelo novaeguineae*) and cats. Pair formation can occur at 6 months of age, and individuals may breed in immature plumage. Greatest recorded longevity in excess of 12 years 3 months.

**Movements.** Mainly sedentary, although juveniles disperse from natal area; all recaptured marked individuals were less than 10 km from initial ringing site.

**Status and Conservation.** Not globally threatened. Common throughout range. Adversely affected locally by clearance; recorded as returning to logged areas c. 5 years after logging. More abundant in regenerating forest in gulleys than in mature forest in gulleys. Invasive plants that are low and dense (e.g. *Lantana*) have permitted expansion away from forested areas.

**Bibliography.** Chandler (1910), Clarke (1972), Cracraft (1986), Davidson & Langmore (1991), Dunn (1993), Frith, C.B. (1992), Frith, D.W. (1984), Hanks (1930), Higgins & Peter (2002), Hindwood (1940c), Joseph *et al.* (1993), Keast (1958a, 1993), Littlejohns (1918), Mathews (1922), McColl (1955), McGuire (2005), Mennill & Rogers (2006), Robertson, S. (1999), Rogers (2005), Rogers & Mulder (2004), Schodde & Mason (1999), Watson (1969), White (1987b), Woodall (1997).

### 13. Western Whipbird

#### *Psophodes nigrogularis*

**French:** Psophode à menton noir

**German:** Grauschopf-Wippflöter

**Spanish:** Zordala Crestada Occidental

**Other common names:** Black-throated Whipbird/Coachwhip-bird, Rainbird, Mallee Whipbird (*oberon*, *leucogaster* and *lashmari* combined)

**Taxonomy.** *Psophodes nigrogularis* Gould, 1844, between Perth and Albany, on coast of south-west Western Australia, Australia.

Has been proposed that races *oberon*, *leucogaster* and *lashmari* form a separate species, distinct from nominate, but such treatment not supported by data from genetic study. Four subspecies currently recognized.

**Subspecies and Distribution.**

*P. n. nigrogularis* Gould, 1844 – Two Peoples Bay, in S Western Australia.

*P. n. oberon* Schodde & Mason, 1991 – mallee heaths of SW Western Australia.

*P. n. leucogaster* Howe & Ross, 1933 – Yorke Peninsula (probably also Eyre Peninsula) and Murray Mallee, in SE South Australia and NW Victoria.

*P. n. lashmari* Schodde & Mason, 1991 – Kangaroo I, off SE South Australia.

**Descriptive notes.** 19–25.5 cm; 45 g. Nominative race has crown and short triangular crest greyish-brown, face and nape olive-brown, lores off-white; upperparts olive, tinged with grey; upwing greyish-olive, remiges, primary coverts and greater wing-coverts with brown inner webs; tail grey-olive, all rectrices except central pair with black subterminal band broadening outwards and pale tips (buff, becoming white outwards); thin black moustachial stripe, broader white submoustachial stripe, black centre of chin and throat to upper breast; breast and belly olive-grey with diffuse off-white stripe along centre, flanks olive-brown, undertail-coverts brown; iris dull red to brown; bill black or sooty black; legs dark grey. Sexes alike. Juvenile lacks moustachial stripes and black on underparts; immature like adult, but submoustachial stripe with brownish tinge, black chin and throat with pale mottling. Race *leucogaster* is greyer than nominate, has longer wing and tail, broader and better-defined subterminal band on tail, black moustachial stripe more diffuse or occasionally absent, black on chin and throat less extensive; *lashmari* is similar to previous but darker, with broader subterminal tailband; *oberon* is also similar, but has longer wing and tail, and pronounced black moustachial stripe. Voice. Song loud, carrying up to 800 m, reportedly ventriloquial, an antiphonal duet, songs of each sex different and given in quick succession without discernible break (sounding as if by single individual); sex responsible for each segment uncertain, but male assumed to produce first part, a high varying grating series of whistles with cadence of “it’s a téechers pet”, and female following with shorter, less varying “ti-tickert-tear”. Contact call a clucking “chuck”; scolding churr, also two notes followed by upward trill.

**Habitat.** Sites with dense shrubby understorey 1.5–2 m tall, either as heath-like thickets or with open overstorey of mallee eucalypt (*Eucalyptus*) 2–5 m tall, former more often coastal, latter more inland.

**Food and Feeding.** Arthropods, mainly insects, some spiders (Araneae); also small molluscs. Forages primarily on ground, sometimes in low vegetation. Probes among litter and on fallen branches, and gleams from low vegetation; occasionally forages on tree bark. Uses bill, not feet, to turn over leaves.

**Breeding.** Season Jul–Oct. Apparently monogamous. Territorial throughout year; countersings with neighbouring conspecifics, chases occur at territory borders. Nest, apparently built solely by female (observed carrying nesting material), a robust bowl of twigs, bark, grass (on coast, sedges), lined with finer material of thin twigs, grass and thin bark strips, that of nominate race with external diameter 10.2–14.5 cm, height 7.2–12 cm, internal diameter 6.7–8 cm, depth 4–5.5 cm; placed less than 1 m from ground (often below 0.5 m) in low dense shrub; territory size apparently varying geographically, 2.8–5.6 ha in coastal thickets, c. 12 ha in mallee (clutch 2 eggs, pale blue with black spots, splenches and streaks, size 25.7 × 27.7 × 18.22 mm, incubation by both sexes, only female at night, she also does greater share during day, amount increasing in second half of incubation period, male calls female from nest to feed her; incubation period 21 days; chicks brooded and



led by both sexes for 10 days, leave nest at 10–12 days, run well but cannot fly, fed by parents for at least 2 months; if two young, each adult feeds one fledgling. In small sample, hatching success 54%, 54% of hatchlings banded.

**Movements.** Sedentary; ringed individuals at Two Peoples Bay (nominate race) observed repeatedly during 1971–1977 study.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species, present in South-east Australia EBA and South-west Australia EBA. Locally common to rare. Has undergone range contraction owing to habitat clearance and fragmentation, and changed fire regimes; now exists in a number of isolated populations. Current approximate population and range sizes of races as follows: nominate numbers c. 2500 breeding individuals in total range of 300 km<sup>2</sup>, present at three localities (largest with 1500 individuals), considered vulnerable but increasing; *oberon* 10,000 breeding individuals in 800 km<sup>2</sup>, twelve localities (largest subpopulation 5000 individuals), declining; *leucogaster* 2000 breeding individuals in less than 200 km<sup>2</sup>, five localities, some with fewer than 100 individuals (largest subpopulation with 1000), endangered and declining; *lushmari* numbers 5000 breeding individuals in 500 km<sup>2</sup>, with two subpopulations (largest with 4000 individuals), considered stable. Home range of mallee-dwelling pairs 10–19 ha. Major losses recorded in 20th century; nominate race had disappeared from area N & W of current range by early 1900s; range of race *leucogaster* has contracted in Yorke Peninsula and in SE South Australia, and no records of this race in NW Victoria since mid-1980s. Fire a major threat; although there are records of sites being recolonized by this species within 6 years of fire, in most areas it requires at least 14–25 years; indeed, at Two Peoples Bay, estimates that it would need at least 30 years, and optimally 50 years, post-burning before recolonization occurred.

**Bibliography.** Anon. (2006b), Ashby (1921), Barrett *et al.* (2003), Baxter (1995), Boles (1988), Butchart & Stattersfield (2004), Cale & Burbidge (1993), Campbell (1901), Chisholm (1946), Christidis & Norman (1999), Collar *et al.* (1994), Comer *et al.* (2005), Condon (1966b), Garnett & Crowley (2000), Higgins & Peter (2002), Johnstone & Storr (2004), Keast (1958a), Mathews (1922), McNee (1986), Milligan (1902b, 1904a), North (1904), Parker & Reid (1979), Schodde & Mason (1991, 1999), Smith, G.T. (1977, 1991), Smith, G.T. & Smith (1985), Stattersfield & Capper (2000), Webster (1966), Whitley (1971), Whittell (1941, 1952), Woinarski (1989a).

## 14. Chirruping Wedgebill

### *Psophodes cristatus*

**French:** Psophode bahillard **German:** Buschflöter **Spanish:** Zordala Picocuña Oriental  
**Other common names:** Eastern Wedgebill; (Crested) Wedgebill (when treated as conspecific with *P. occidentalis*)

**Taxonomy.** *Sphenostoma cristatum* Gould, 1838, New South Wales, Australia. Formerly considered conspecific with *P. occidentalis* and placed in the monotypic genus *Sphenostoma*; morphologically very similar to aforementioned species, but differs markedly in vocalizations. Monotypic.

**Distribution.** SE Northern Territory, SW Queensland, NE South Australia and NW New South Wales.



**Descriptive notes.** 19.5–20 cm; 39–42 g. Has conspicuous forward-curving crest dark brown, often with black tip; otherwise grey-brown above, wings somewhat darker than upperparts; tail dark grey-brown or brown, all feathers except central pair broadly tipped white; chin, throat and centre of belly off-white, breast and belly side pale grey-brown (paler than and contrasting with upperparts), breast with faint diffuse streaking, undertail-coverts brown; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile is similar to adult but paler, with plumage fluffier, secondaries and upwing-coverts edged with light

cinnamon, bill pale; immature also like adult, but bill horn-brown, edges of secondaries and wing-coverts paler. **Voice.** Song one of earliest bird songs in morning, continues throughout day and often at night, repeated monotonously, an antiphonal duet between sexes, male gives ascending “chip chip cheroo” (occasionally “chip cheroo”), first 2 notes soft, next 2 very loud (audible to at least 400 m), female adds loud “chirrri”.

**Habitat.** Low shrublands, particularly chenopods, such as bluebush (*Maireana*), and acacia (*Acacia*), also other low dense vegetation such as emu-bush (*Eremophila*), lignum around swamps and waterways, and *Casuarina* associations.

**Food and Feeding.** Diet consists of insects and some seeds. Forages singly, in pairs and in small groups; rarely joins mixed species foraging flocks. Feeds on ground; said to forage also in low vegetation.

**Breeding.** Season Jul–Mar, most eggs Aug–Dec, possibly regulated by rainfall; one or more broods per season. Nest an open cup of small sticks, sometimes grass, rootlets and dry stems, lined with grass and rootlets, external diameter 12.7–13.3 cm, height 6.4–7.6 cm, internal diameter 6.4–7 cm, depth 3.8–5.1 cm; placed 0.45–4.6 m (mean 1.5 m) above ground in fork in dense shrub or small tree in dense vegetation, or in clump of mistletoe (*Loranthaceae*). Clutch 2 or 3 eggs, light blue or greenish-blue with small black and dark purple spots, blotches and streaks, average 24.8 × 17.7 mm; incubation by both sexes, period 14–17 days; both also feed nestlings, no information on duration of nestling period.

**Movements.** Not well understood; no large-scale movements known, but possibly nomadic in response to local resources; considered resident in some areas. All recaptured marked individuals were found less than 10 km from site where initially ringed.

**Status and Conservation.** Not globally threatened. Locally common; rather scattered throughout range.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Cracraft (1986), Ford (1974b), Ford & Parker (1973b), Gilbrith (1974c), Higgins & Peter (2002), Howe (1928), Mathews (1923b), McGill (1923, 1932), North (1904), Schodde & Mason (1991), Wilson (1974).

## 15. Chiming Wedgebill

### *Psophodes occidentalis*

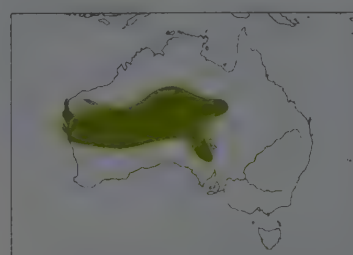
**French:** Psophode carillonneur **German:** Glockenflöter **Spanish:** Zordala Picocuña Occidental

**Other common names:** Western Wedgebill; Chime Bird, Waggonbird, Wheelbarrowbird, (Crested) Wedgebill (when treated as conspecific with *P. cristatus*)

**Taxonomy.** *Sphenostoma cristatum occidentale* Mathews, 1912, Day Dawn, Western Australia, Australia.

Formerly considered conspecific with *P. cristatus* and placed in the monotypic genus *Sphenostoma*; morphologically very similar to aforementioned species, but differs markedly in vocalizations. Monotypic.

**Distribution.** CW Western Australia E to S Northern Territory and NW & C South Australia.



**Descriptive notes.** 19.5–22 cm; male 38–45 g, female 30–36 g. Has conspicuous forward-curving crest dark grey-brown, often with black tip; otherwise fairly dark grey-brown above, wings somewhat darker than upperparts; tail dark grey-brown or brown, all except central pair of feathers broadly tipped white; chin, throat and centre of belly off-white, breast and belly side grey-brown (little contrast with upperparts), undertail-coverts brown; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile is similar to adult but paler, with plumage fluffier, secondaries and upwing-coverts edged with light cin-

namon, bill pale; immature also like adult, but bill horn-brown, edges of secondaries and wing-coverts paler. **Voice.** Song, given monotonously, may start in early morning and continue into dark of night, ventriloquial, of 4–6 descending loud chime-like notes, final note stressed and with metallic ring, transcribed as e.g. “did-you-get-drunk” or “sweet-Kitty-Lintof”; no duetting reported, both sexes giving same song.

**Habitat.** Arid scrublands, particularly with acacia (especially *Acacia aneura*), broombush, mallee and spinifex along river courses; favours areas with abundant mistletoe (*Loranthaceae*) and dense vegetation.

**Food and Feeding.** Very little known. Diet probably consists of insects and seeds; observed to feed on ground.

**Breeding.** Season Jan–Mar and Jul–Sept. Nest a flattened cup of small sticks and grass, lined with grass, placed 0.5–3 m from ground in horizontal or vertical fork or dense clump of vegetation in low tree or shrub. Clutch 2 or 3 eggs, light blue or greenish-blue with small black and dark purple spots, blotches and streaks, average 24.5 × 17.5 mm; incubation period reportedly 17 days, no information on roles of sexes; no information on nestling period; fledglings seen to be fed by two individuals.

**Movements.** Probably sedentary in much of range; no large-scale movements recorded, but possibly some local shifts, particularly in drier regions.

**Status and Conservation.** Not globally threatened. Common in W of range near coast; decreases in abundance towards E, and patchily distributed in C South Australia and S Northern Territory. Decline reported in extreme S of range (NW Nullarbor Plain), possibly resulting from effects of introduced rabbits (*Oryctolagus*) and altered fire regime.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Cracraft (1986), Ford (1971b, 1974b), Ford & Parker (1973b), Higgins & Peter (2002), Johnstone & Storr (2004), Mathews (1923b), Milligan (1905), North (1904), Schodde & Mason (1999), Sedgwick (1990), Serventy & Whittell (1976), Whitlock (1922).

## Genus MELAMPITTA Schlegel, 1871

### 16. Lesser Melampitta

#### *Melampitta lugubris*

**French:** Petite Mélampitte **German:** Glanzflöter **Spanish:** Melampita Chica  
**Other common names:** Lesser Blackwit, Black False Pitta

**Taxonomy.** *Melampitta lugubris* Schlegel, 1871, Arfak Mountains, New Guinea.

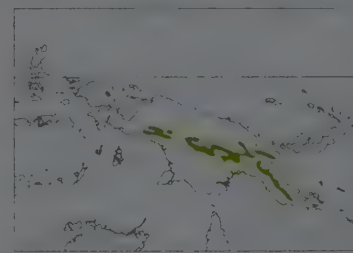
True affinities of genus uncertain; possibly belongs in a family of its own; has sometimes been linked with Paradisaeidae, but present species differs from that family in having downy nestlings and in not feeding them by regurgitation. Three subspecies recognized.

**Subspecies and Distribution.**

*M. l. lugubris* Schlegel, 1871 – Arfak Mts, in NW New Guinea.

*M. l. rostrata* (Ogilvie-Grant, 1913) – Weyland Mts and Nassau Range, in WC New Guinea.

*M. l. longicauda* Mayr & Gilliard, 1952 – mountains of NC & E New Guinea (Oranje Range E to Huon Peninsula and Owen Stanley Range).



**Descriptive notes.** 17–18 cm; 29–32 g. Male has plumage entirely black, forehead glossy, feathers of forehead, forecrown, lores and cheek short and velvety; iris red; bill and legs black. Female differs from male only in having iris dark brown. Juvenile is dark brown or tawny-tinged black above, rusty brown below. It differs minimally; *rostrata* has larger bill than others; *longicauda* has longer tail. **Voice.** Song is a gradually descending series of rapid buzzy notes, “zwee-diddididdidid”. Probable advertising or contact call is a double clicking note, like the sound of a pebble dropping into water or a loud click of the tongue; also a

quiet, short tapping sound when foraging; loud “chit-chit-chit-chit” given by female flushed from nest.

**Habitat.** Mountain forest and adjoining regrowth with dense undergrowth, particularly gulleys in vicinity of streams; 1150–3500 m, mainly 2000–2800 m.

**Food and Feeding.** Insects, including beetles (*Coleoptera*) and larvae, and other invertebrates, e.g. worms and small snails; also, small frogs and fruit. Forages on ground, probes, and uses the bill to flip leaves.

**Breeding.** Active nests in Oct and Nov and estimated egg-laying period late Sept to early Nov; hatching coincides with wet season. Nest dome-shaped, with side entrance, made from live green moss interwoven with plant roots and twigs and a few small dry fern fronds, lined with thick cup of fine plant rootlets, placed c. 2 m from ground on side of live tree-fern trunk, nest material woven

into trunk and around hanging stems of dead fronds and vines. Clutch 1 egg, chalky white, sparsely marked all over with spots and with small blotches of black, grey and grey-purple, mainly at larger end (sometimes forming irregular wreath), size 27.7–30.2 × 22.6–23.9 mm; incubation and brooding by female alone, fed by male both on and near nest, chicks fed by both adults but not by regurgitation; chicks downy, not naked; incubation period at least 27 days, fledging period c. 35 days.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common. Apparently absent from some seemingly suitable localities, reasons for which unknown.

**Bibliography.** Beehler *et al.* (1986), Clapp (1987), Coates (1990), Delacour (1946), Frith & Frith (1990a), Iredale (1956), Majnep & Bulmer (1977), Mayr (1931c), Ripley (1964a), Sibley & Ahlquist (1987b).

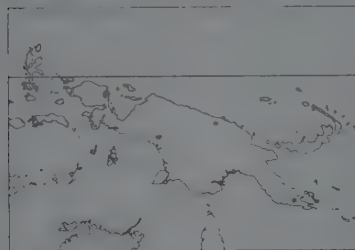
## 17. Greater Melampitta

### *Melampitta gigantea*

**French:** Grande Mélampitte **German:** Rußflöter **Spanish:** Melampitta Grande  
**Other common names:** Giant False Pitta

**Taxonomy.** *Melopitta gigantea* Rothschild, 1899, Mount Moari, Arfak Mountains, New Guinea. True affinities of genus uncertain; possibly belongs in a family of its own; has sometimes been linked with Paradisaidae, but congeneric *M. lugubris* differs from that family in having downy nestlings and in not feeding them by regurgitation (details currently unknown for present species). Monotypic.

**Distribution.** W, N & far SE New Guinea: Vogelkop (Arfak Mts), Bomberai Peninsula (Fakfak Mts, Kumawa Mts), S slopes of Snow Mts (R Utakwa, R Setekwa), Torricelli Mts (Mt Somoro) and SE end of Central Dividing Range (Mt Mura).



**Descriptive notes.** 29 cm; 205 g. Body plumage is entirely black, or with varying amounts of rufous-brown on head, various parts of upperparts and underparts; demarcation between differently coloured areas sharp or irregular, particularly between black breast and brown belly; variations apparently related at least in part to age and possibly to geographical location, but not well understood; iris dark brown; bill and legs black. Sexes alike. Juvenile undescribed. **VOICE.** Monotonously repeated pair of fairly loud, moderately high-pitched notes, given only during day.

**Habitat.** Forests on rugged limestone (karst),

at 650–1400 m.

**Food and Feeding.** No information. Diet probably insects.

**Breeding.** No confirmed information. According to local people in Fakfak Mts, nest a large basket of vines, suspended below ground level in deep, narrow, steep-sided limestone sinkhole.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Papuan Highlands EBA, North Papuan Mountains EBA and Central Papuan Mountains EBA. Shy, little known and apparently very local; locally fairly common in Fakfak Mts, in W of range. This species' apparent rarity in most of its known range may be related to its preference for an environment that is usually avoided by fieldworkers. Future work in these areas may reveal that it is more widespread than presently thought.

**Bibliography.** Coates (1990), Delacour (1946), Diamond (1983, 1985), Gregory (1995b, 1996), Hartert (1930), Iredale (1956), Richard & Rowland (1995), Rothschild (1899).

## Genus *IFRITA* Rothschild, 1898

### 18. Blue-capped Ifrit

#### *Ifrita kowaldi*

**French:** Ifrita de Kowald **German:** Blaukappenflöter **Spanish:** Ifrita  
**Other common names:** Ifrit(a), Blue-wreathed Ifrit, Bluecap, Blue-capped Babbler

**Taxonomy.** *Todopsis kowaldi* De Vis, 1890, Owen Stanley Mountains, New Guinea.

True affinities uncertain; possibly belongs in a separate, monotypic family. Two subspecies recognized.

**Subspecies and Distribution.**

*I. k. brunnea* Rand, 1940 – Weyland Mts and Nassau Range, in WC New Guinea.

*I. k. kowaldi* (De Vis, 1890) – C & E highlands of New Guinea, including Huon Peninsula.



**Descriptive notes.** 16–17 cm; 34–36 g. Male nominate race has crown feathers black with broad shiny blue tips (crown appears blue with black central patch and border), centre of nape with small ochre patch; lores whitish, side of head ochre, short white supraorbital line, white or buffy postorbital line, ear-coverts mottled dusky and buffy ochre; upperparts, including upperwing and tail, dark olive-brown, upperwing-coverts with small buffy spot at tips; ochre below, throat paler, lower belly and flanks washed olive; iris dark brown; bill brown; legs greyish-olive. Female is like male, but postorbital line pale ochraceous. Juvenile

resembles female, but forehead ochraceous brown, wing-coverts tipped ochraceous. Race *brunnea* differs from nominate in having upperparts brownish-olive, remiges and tail more rufous-brown. **VOICE.** Song 5 or 6 rapid, rather buzzing notes, slightly rising and then falling, “zig-zig-zig-zig-zig”; also, a series of louder, squeaky, musical rising and falling notes with quality of a baby's squeeze toy. Three-note “jitji-jit” when foraging; also a buzzy scold.

**Habitat.** Montane forest, particularly mossy forest; c. 1460–3680 m, mainly 2000–2900 m.

**Food and Feeding.** Insects, including beetles (Coleoptera); occasionally soft fruit. Forages from low down, on fallen logs, to upper branches. Creeps up trunks and on branches in manner of a nuthatch (*Sitta*); probes into moss and on underside of branch while hanging on to upper surface, using tail as brace. Joins mixed-species foraging flocks.

**Breeding.** Nest with egg in Sept, nests with chick in Oct and late Nov, and fledgling in late Aug, indicating breeding during middle and late dry season, start of wet season and late wet season, at least. Nest a deep, bulky, thick-walled bowl of green moss and some leaf-fern, lined with fine tendrils or rootlets, placed c. 3–6 m above ground in sapling. Clutch 1 egg, white with very sparse clear black and purple-black spots and blotches, larger and more dense at larger end, average 25.8 × 20.7 mm. No further information.

**Movements.** Probably sedentary.

**Status and Conservation.** Not globally threatened. Generally fairly common, although occurs at low density in many places.

**Bibliography.** Ames (1975), Beehler (1978b), Bell (1971), Coates (1990), Delacour (1946), Deshayes (1967), Diamond (1972), Dumbacher, Spande & Daly (2000), Dumbacher, Wako *et al.* (2004), Frith (1971a), Görlich (1995), Gyldenstolpe (1955a), Harrison (1967b), Hopkins (1990), Iredale (1956), Junge (1953), Majnep & Bulmer (1977), Mayr & Gilliard (1954), Mayr & Rand (1937), Mitsch (1983), Ogilvie-Grant (1915), Rand (1940b, 1942b), Rothschild (1899, 1920), Sims (1956), Stresemann (1922).

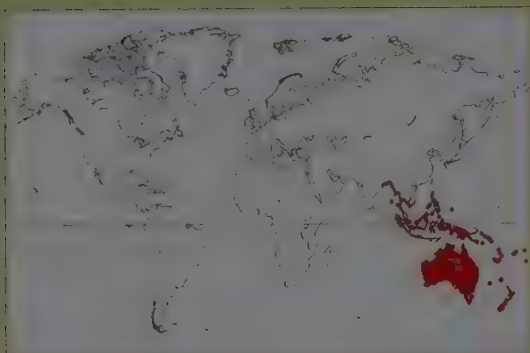


## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family PACHYCEPHALIDAE (WHISTLERS)



- Small to medium-sized passerines, generally with short broad wings, square-ended or slightly notched tail of variable length, most with sturdy bill with pronounced tomial notch and terminal hook, two species with bill laterally compressed and disproportionately deep, many with robust legs; plumage mostly various combinations of grey, black, brown, white, rufous, greenish and olive, some bright yellow below, a few streaked.
- 12–28.5 cm.



- South Asia and Wallacea east to Australasia and islands of central and south Pacific.
- Wooded habitats, especially rainforest, sometimes mangroves, also scrub.
- 12 genera, 56 species, 247 taxa.
- 2 species threatened; no species extinct since 1600.

**Systematics**

The Pachycephalidae as presently constituted consists of 56 species in twelve genera. The latter are made up of a central cluster of three genera, containing the whistlers (*Pachycephala*), the shrike-thrushes (*Colluricincla*) and the pitohuis (*Pitohui*), together with several monotypic genera, some with debatable affinities. Members of the family occur west to east India, north to Micronesia and east to Samoa. The stronghold of the family is New Guinea, which is home to seven genera and 22 species, followed by Australia, with four genera and 14 species. Whether or not this family is represented also in New Zealand is uncertain, although the endemic genus *Mohoua* may belong in this group and is provisionally included within it, pending further research. Another candidate is the now extinct Piopio (*Turnagra capensis*), the only member of its genus, which was confined to New Zealand.

Although the recognition of twelve genera is perhaps a somewhat liberal treatment, some authors would employ only eight. The number of species, in contrast, is more conservative than in some arrangements, in which the figure exceeds 60, while others may recognize somewhat fewer than 50 species. This variation reflects the uncertain nature of the taxonomy within the Pachycephalidae; such instability extends to the delimitation of the family.

Owing to the sturdy, hooked bill, some members of this family were once placed with the shrikes (Laniidae). Eventually, they were brought together with the whistlers, usually as a subfamily of an expansive Muscipidae. With the exception of the genus *Mohoua*, all taxa included in the present treatment were placed by E. Mayr, in J. L. Peters's *Check-list of Birds of the World*, in a subfamily Pachycephalinae. *Mohoua* was segregated in subfamily Mohouinae of the family Acanthizidae, the thornbills or Australasian warblers. Since then, molecular work has indicated that there is no connection between the pachycephalids and the muscipapine Old World flycatchers. The former appear to be a component of the vast corvid radiation that is now recognized as having its origins in the Australian region, to which many groups are still largely confined, whereas the latter are part of a different section of the Passeriformes.

By far the most speciose genus is *Pachycephala*, with 32 species of whistler. Depending on the classification preferred, this number could be more than 40. Whistlers are of considerable biogeographical interest because of the complex and often puzzling variation of some species, which include numerous island populations.

Three larger-bodied, rather dull-coloured, skulking Australian species have been segregated in the subgenus *Timixos*. Two of them show obvious but not extensive sexual dimorphism. It has been suggested that these three species represent one of the earlier lineages in the genus. The Olive Whistler (*Pachycephala olivacea*)



Allocated its own monotypic genus, the **Wattle-ploughbill** is a strange creature. A small, dumpy bird, its most striking feature is the male's large circular pink wattle, which extends from the gape to the sides of the throat. Equally peculiar is the bill shape. Seen side-on, it is short and deep, with a hooked upper mandible, but head-on it reveals itself also to be laterally compressed. The resulting wedge shape helps the Wattle-ploughbill with its specialized foraging strategy of chipping or stripping away bark to get at the insects beneath.

[*Eulacestoma nigropectus*, Mount Hagen, EC New Guinea. Photo: William S. Peckover]



One of the smallest and lightest members of Pachycephalidae is the strikingly plumaged Goldenface of New Guinea. It is the only member of its genus. It is dumpy and short-tailed, and has short, rounded wings, as well as a proportionately long bill. Its bright yellow underparts are cited as one of the grounds for a taxonomic relationship with the "true" whistlers of the genus Pachycephala. However, other plumage features, notably the white tertial tips that are unique among pachycephalids, and also behavioural aspects, suggest that the Goldenface's true taxonomic affinities may lie elsewhere.

[Pachycephala

flavogriseum subpallidum,  
Crater Mountain,  
EC New Guinea.  
Photo: William S. Peckover]

occurs in the south-eastern mainland and Tasmania. Gilbert's Whistler (*Pachycephala inornata*) is broadly, though sparsely, distributed across the southern edge of the mainland, while the Red-lored Whistler (*Pachycephala rufogularis*) is found in isolated fragments of its former range in the eastern part of southern Australia. The two last-mentioned are similar in appearance, the females being particularly close to each other in appearance. Neither exhibits marked geographical variation, and no subspecies are currently recognized, although there is a trend for eastern populations of Gilbert's Whistler to have a slightly longer tail and paler underparts than those in the west. Variation in the Olive Whistler is more complex. A recent revision maintained five races in this species' rather small range; these occur in allopatric populations, with somewhat minor but constant differences in the degree of sexual dimorphism, size and intensity of coloration. Major dissimilarities of song are evident between some populations.

Possibly associated with this species group, to which it displays similarities in its unpatterned, monomorphic plumage and its skulking habits, is the Rusty Whistler (*Pachycephala hyperythra*) of New Guinea. If its affinities do not lie with the *Timixos* whistlers, it is not clear what other species are its closest relatives.

Other species of uncertain relationships within the genus are the Brown-backed Whistler (*Pachycephala modesta*) and the Grey Whistler (*Pachycephala simplex*). The former occurs in the highlands of the eastern half of New Guinea, an unusual distribution and one not matched by any other member of the family. Previously, the eleven subspecies of the Grey Whistler were treated as representing two species, the subspecies being allocated according to the colour type to which they belonged: birds of northern Australia and southern New Guinea, lacking yellow pigmentation in the plumage, were separated as the "Brown Whistler", while those in north-east Australia and lowland New Guinea, with varying degrees of yellow on the underparts, were recognized as "*P. griseiceps*" and referred to as the "Grey Whistler". The current practice of combining all these forms as a single species may warrant re-examination.

One of the most widely spread species is the Mangrove Whistler (*Pachycephala cinerea*), which ranges in coastal regions from the western side of the Bay of Bengal, in north-east India, eastwards and southwards to south-east Vietnam, and through the major islands of Sumatra, Borneo and Java and numerous satel-

lite islands. Its distribution was formerly regarded as including the Philippine Islands until a review by K. C. Parkes raised those populations, other than that on Palawan, to species level. This group is represented in the northern half of the Philippines by the White-vented Whistler (*Pachycephala homeyeri*) and in the southern half by the Green-backed Whistler (*Pachycephala albiventris*). The Philippine species differ in plumage colour from the Mangrove Whistler, which is quite uniform across its range. Several subspecies have been described at times, but none of these except the Palawan population seems to be tenable. Palawan birds have themselves sometimes been treated at species level, as "*P. plateni*". The Mangrove Whistler and the two Philippine species form a superspecies, the fourth member of which is the Island Whistler (*Pachycephala phaionota*), a specialist living on small islands from the Moluccas east to western New Guinea.

There has been some confusion regarding the scientific name applicable to the Mangrove Whistler. This species had long been referred to by most authors as *P. cinerea*, but in 1970 A. K. Mukherjee proposed that its correct name was *P. grisola*. He based this on his claim that a female specimen from botanical gardens by Calcutta, in north-east India, was the type of *grisola*, noting that it was indistinguishable from the later-named *cinerea*. Many authors have therefore used the name *grisola* for this species, but, as recently pointed out by M. P. Walters, there are serious complications with this usage. In 1843, E. Blyth named as *Tephrodornis grisola* a specimen which, he stated, he had already, in 1842, described as a variant of *T. superciliosus*; the latter name was subsequently synonymized with *T. pondicerianus*, the Common Wood-shrike. Later, in 1847, in a new monotypic genus he described the species *Muscitrea cinerea*, from Ramree Island, on the west coast of Myanmar. Subsequently, in 1852, Blyth issued a catalogue of the birds in the Museum of the Asiatic Society, in which he listed a female specimen from Calcutta's botanical gardens, but there was no mention of the type specimen of the name *grisola*. The aforementioned female specimen is noted as having been collected in 1843, so unless the date was somehow confused, it could not possibly be the type of *grisola*, as that particular skin had already been referred to by Blyth himself in 1842. The most likely explanation seems to be that the type of *grisola* had been lost prior to Blyth's catalogue, making the name *grisola* effectively unidentifiable. In any event, there appear to be too





The **Shrike-tit** is the only member of its genus. Its deep bill is laterally compressed, enabling it to specialize in stripping bark from branches to get at insects lurking underneath, the bird slipping its bill under the bark and twisting its head to lever off the bark. The Shrike-tit's bold black, white and yellow plumage is somewhat reminiscent of the Golden Whistler (*Pachycephala pectoralis*) and, with no better alternative apparent meantime, it has been partly responsible the Shrike-tit being placed in the whistler family. The Shrike-tit's erectile crest is an unusual feature for a pachycephalid, being shared by only two other family members.

[*Falcunculus frontatus frontatus*,  
You Yangs,  
Victoria, Australia.  
Photo: Peter Fuller]

many uncertainties surrounding the name *grisola*, so *cinerea* has once more become the accepted name for this species.

Another superspecies of small, monomorphic taxa overlaps geographically with the "cinerea group". The Yellow-bellied Whistler (*Pachycephala philippensis*) occurs widely through all elevations in the Philippines, where it is sympatric with both the White-vented and the Green-backed Whistlers. It is replaced in Indonesia by the Sulphur-bellied Whistler (*Pachycephala sulfuriventer*) in Sulawesi and the Bornean Whistler (*Pachycephala hypoxantha*) in Borneo. These are more restricted to montane regions than is the Yellow-bellied Whistler. Other than the wide-ranging Mangrove Whistler, none of this group or the preceding one has been the subject of more than cursory study.

The Rufous Whistler (*Pachycephala rufiventris*) and its closest relatives form a discrete, well-marked complex, characterized by its possession of streaked female and juvenile plumages. The group is sometimes treated as the subgenus *Alisterornis*. The large White-breasted Whistler (*Pachycephala lanioides*), a mangrove specialist of coastal northern Australia, while obviously related to the other members, stands apart. The remaining forms present problems in classification, and a number of arrangements have been presented, the least conservative of which recognizes five species. The Rufous Whistler is widespread through mainland Australia and the drier parts of New Caledonia. Its most obvious difference from the others is the light rufous belly of the male. In south-east New Guinea and on Rossel Island, the White-bellied Whistler (*Pachycephala leucogastra*) closely resembles the Rufous Whistler in behaviour, voice and appearance, differing primarily in the absence of the ventral rufous coloration. A second species having a white throat separated from the white underparts by a black breastband, the Wallacean Whistler (*Pachycephala arctitorquis*), is found on several smaller islands in Wallacea. The Black-headed Whistler (*Pachycephala monacha*) of New Guinea and the Aru Islands has the throat black in the male, but the rest of the plumage is similar to that of the other species. A second Wallacean species is found in the Moluccas and neighbouring islands. This one, the Drab Whistler (*Pachycephala griseonota*), has hen-plumaged males, but these resemble the females of the other forms.

Within this group, the Black-headed and White-bellied Whistlers are frequently regarded as conspecific, on the basis that they

hybridize in south-eastern New Guinea. Other arrangements are to keep the Black-headed Whistler as a separate species while uniting the White-bellied and Wallacean Whistlers or, alternatively, to expand the Rufous Whistler to include the very similar White-bellied Whistler. Some authors, including Mayr in Peters's *Check-list*, have treated all populations of this group except the White-breasted Whistler as a single species, under the name *P. rufiventris*. Although hybridization between the Black-headed and White-bellied Whistlers has been recorded at several localities, this is almost always in areas where the former has colonized rubber plantations in rainforest adjacent to eucalypt (*Eucalyptus*) woodlands, the major habitat of the latter species. Such areas are often close to places where the different altitudinal zones of the higher-elevation Black-headed and lower-elevation White-bellied Whistlers approach each other. Since interbreeding between these two appears to be a result of human-induced habitat disturbance, it may not be sufficient evidence to suggest that they are of the same species. The White-bellied Whistler is much more similar to the Rufous Whistler, and it is with that form that its closest relationship is likely to lie. There seems no particularly good reason to regard it as closer to the Wallacean Whistler than to any of the others in this group.

The Golden Whistler (*Pachycephala pectoralis*) provides one of the most interesting and complex examples of geographical variation in the avian world. This species is the most widely distributed member of the family, occurring from eastern Java eastwards through island groups to as far as Fiji; it is also found widely in south-western and eastern Australia, including Tasmania. More than 70 regional subspecies have been named, many initially described at the species level. A large proportion of these resulted from Mayr's descriptions of specimens obtained during the Whitney South Sea Expeditions in the 1920–1930s. Several closely related and morphologically similar species occur within the range of the Golden Whistler. Across its range, and even within some island groups, the subspecies of Golden Whistler exhibit plumage variation that far exceeds that between the nominate race and closely related species. That these races were for long regarded as distinct species is not surprising.

In a major work, published in 1956, I. C. J. Galbraith took on the mammoth task of revising all the forms of the Golden Whistler. He identified eight subspecies groups, which he designated

**The Rufous-naped Whistler** is a striking pachycephalid. Its white breast and belly and russet nape contrast with otherwise olive and grey plumage. It has a fairly chunky, long bill with a distinctive hooked tip to the upper mandible.

The strong legs are an adaptation to the species' largely terrestrial life in the montane forests of New Guinea. While the Rufous-naped Whistler is often placed with "true" whistlers in the genus *Pachycephala*, its preference for the ground and understorey, together with its more robust structure, have led to it being allocated its own monotypic genus.

[*Aleadryas rufinucha gamblei*, Crater Mountain, EC New Guinea.

Photo: William S. Peckover]



alphabetically from "A" to "H". In general terms, the ranges of each of these were as follows: "A" was found in the Lesser Sunda Islands; "B" in the Moluccas; "C" in the Solomon Islands; "D" in Fiji; "E" in northern Australia, New Guinea and the Bismarck Archipelago; "F" in southern Australia; "G" in southern Melanesia, comprising New Caledonia, the Loyalty Islands, the New Hebrides and the Banks Islands; and "H" was widespread, occurring from the southern Moluccas and Timor eastwards through south-east New Guinea and the Bismarck Archipelago to the Santa Cruz Islands, Fiji and Tonga.

Because the first seven of these groups occupy discrete areas, it is possible that they each may with some justification be recognized as distinct species. These were regarded as representing earlier colonizations, after which there was sufficient time for them to evolve their distinctive local plumages. Group H is widespread, found across the length of the species' range from west to east, and it was considered to be the result of a second wave of colonizers. Its members are more uniform in appearance, with plumages that might be considered as the "typical" form for the species, characteristic of Australian populations. In several areas, however, members of group H encountered those of other groups, resulting in populations with intermediate and, often, quite variable plumages, interpreted as indications of hybridization. In Fiji, for example, whistlers in the northern islands have acquired very distinctive plumages, while those in the southern islands are much more similar in appearance to the "typical" form. These disparate assemblages are joined by intermediate populations in the intervening islands. Other evidence of interbreeding of group-H members with others is found on San Cristobal, in the Solomon Islands, as well as in some Bismarck and Fiji populations. Galbraith considered that some of the intergradation could be primary, but in other cases it was obviously secondary. For this reason, and despite the extensive variation throughout the range, these populations are maintained as a single species. Mayr, in Peters's *Check-list*, largely followed Galbraith's conclusions, differing somewhat in the subspecies recognized.

Galbraith subsequently recorded *pectoralis* (group F) and *melanura* (group E) within a few kilometres of each other in north-eastern Australia, but in different habitats, the former occupying rainforest and the latter in mangroves. As the rainforest extends

to a point closely approaching, or even meeting, the mangroves, it is very likely that these two forms also exist in close proximity to each other. Because they exhibit ecological segregation, without interbreeding, they are now regarded as distinct species, with group E recognized as the Black-tailed Whistler (*Pachycephala melanura*). This practice was supported by J. M. Diamond, who caught individuals of both species in the same mist-net on Tolokiwa Island, in the Bismarcks.

Notwithstanding this treatment, there is evidence of occasional interbreeding on islands where the range of the Black-tailed Whistler and that of the Golden Whistler abut in the Shortland Islands, off south Bougainville. Here, some individuals more closely resemble a neighbouring form of the Black-tailed Whistler, others are closer in appearance to the Bougainville subspecies of the Golden Whistler, and some are variably intermediate between these two. More subtle suggestions of hybridization are evident on a few other islands. Such instances are limited to sites intermediate between the preferred habitats of these two whistlers, so they are not regarded as indicative of significant breakdown in reproductive isolation.

Since the Black-tailed Whistler is found either on small islands or, if on the mainland, in mangroves, one population placed with it by Galbraith is better treated as a subspecies of the Golden Whistler. The form *halim* is known only from a few high-altitude river valleys on the north side of the Snow Mountains, in west-central New Guinea, a habitat and geographical setting very atypical of the Black-tailed Whistler.

Mayr separated as a distinct species the New Caledonian Whistler (*Pachycephala caledonica*), which Galbraith had included in the Golden Whistler. It has been recent practice to treat the Tongan Whistler (*Pachycephala jacquinoti*), too, as a full species. Justification for maintaining these as separate from the Golden Whistler while other populations are not treated similarly is rather weak. Galbraith included the Tongan Whistler, under the name *melanops*, in his group H. The New Caledonian Whistler (group G), although having some unusual characters, such as long throat feathers and rufous-tinged underparts, does not fall outside the range of variation found among Golden Whistler populations. In terms of plumage it is rather unlike populations on other islands in the vicinity, but its separation is biogeographically anomalous. The possible merging of the form *caledonica*,



described by J. F. Gmelin in 1789, with *pectoralis*, described by J. Latham in 1801, would seem to necessitate altering the species name of a large complex that already offers massive scope for confusion. However, in 1956 the International Commission on Zoological Nomenclature placed the name *pectoralis* on the *Official List of Specific Names in Zoology*. This effectively means that the name is given a form of protected status, so that even if it is treated as conspecific with another form of older name, *pectoralis* must remain the valid name for the species in question.

One proposal is to separate the Golden Whistler into several species, elevating most of Galbraith's clusters, or subsections of these, to species rank, sometimes incorporating the local members of group H. While it is likely that several such species will be found to warrant recognition, this idea has not yet been formally presented other than in a taxonomic list. No discussion on, or analysis of, hybridization and other issues has taken place, and more detailed assessment of all the factors is required before such a taxonomic decision is made. It is still uncertain to which species some populations would be best assigned if these were separated. It is nonetheless worth indicating the proposed delimitations and names of these forms. Thus, the Golden Whistler, the Black-tailed Whistler and the Tongan Whistler are recognized as described above. Galbraith's groups A and B are the "Fulvous-tinted Whistler (*P. fulvotincta*)" and the "Black-chinned Whistler (*P. mentalis*)", respectively. Those populations in group H that are found on islands in the Banda Sea region are segregated as the "Banda Sea Whistler (*P. macrorhyncha*)". The component occurring on the islands off south-eastern New Guinea and in the Bismarck Archipelago becomes the "Bismarck Whistler (*P. citreogaster*)"; its relationship to the strictly delimited Golden Whistler requires examination. Group C is separated as the "Yellow-throated Whistler" or "Oriole Whistler (*P. orioloides*)". The "Fiji Whistler (*P. vitiensis*)" comprises group D of the northern Fijian islands, together with the southern Fiji and Santa Cruz members of group H. The New Caledonian Whistler (*P. caledonica*), usually restricted to the population on New Caledonia, is expanded to incorporate those on the Loyalty Islands, Vanuatu and Vanikoro, this revised assemblage corresponding to Galbraith's group G.

Some of these divisions are intuitively convincing, and others less so. Treatment of the geographical differentiation within this group on the basis of external morphology has probably been taken as far as it can be. The application of modern molecular techniques in determining the limits of these populations and in reconstructing their evolutionary history holds the promise of being one of the most fascinating studies in avian evolution.

At the eastern periphery of the Golden Whistler's distribution is the Samoan Whistler (*Pachycephala flavifrons*). Although it almost certainly arose from an early colonization by this lineage, it has generally been treated as a distinct species owing to its distinctive plumage and the lack of any apparent interbreeding with other whistler forms.

Sclater's Whistler (*Pachycephala soror*) is quite similar in appearance to the Golden Whistler and could reasonably be considered the hill-forest form of it. The Golden Whistler has only a tenuous distribution in New Guinea, with the subspecies *balim* restricted to river valleys on the north side of the Snow Mountains. This area is characterized by consisting of modified habitats, with the loss of primary forest and its replacement by secondary growth. Here, Sclater's and Golden Whistlers have been found within a few kilometres of each other but with no evidence of their interbreeding. A similar situation occurs in modified areas in coastal regions of the south and south-east mainland and on some larger islands off the eastern tip, where Sclater's closely approaches the equally similar Black-tailed Whistler, again with no interbreeding recorded, despite their proximity.

Replacing Sclater's Whistler at higher altitudes, with some overlap, is the Regent Whistler (*Pachycephala schlegelii*). While obviously a member of this species group, it is rather more ornately coloured than most, and there has been no dispute regarding its status as a full species.

Whereas the previous two species are widespread in New Guinea, the next three are much more restricted and poorly known. Lorentz's Whistler (*Pachycephala lorentzi*) was initially described as a subspecies of the Regent Whistler, and it was not until it was found sympatrically with that species that its true taxonomic status was recognized. Both sexes of the monomorphic Lorentz's



In structure, the **Mottled Whistler** is a typical pachycephalid. It has a robust body, broad wings and strong legs. The large, rounded head sports a bill that is moderately long with a shrike-like hooked tip. In plumage, however, the Mottled Whistler is sufficiently distinct from other members of Pachycephalidae to merit its own genus. Both sexes have a streaked crown and hindneck and mottled underparts, although, unusually for the family, the female is more intensely marked than the male. The streaked mantle of this bird suggests it is a female, while the rufous tips to the greater coverts hint at immaturity.

[*Rhagologus leucostigma obscurus*, Huon Peninsula, NE New Guinea. Photo: William S. Peckover]

In structure, the **Regent Whistler** is typical of the true whistlers of the genus *Pachycephala*. Its large, rounded head gives rise not only to the genus name but also to the old vernacular name of "thickhead". It is a dumpy bird with a moderately long tail. Plumage-wise, the Regent Whistler is as ornate as befits its common name. The male's overall pattern recalls some races of the widespread Golden Whistler (*P. pectoralis*), but with more varied colours. In several male *Pachycephala* whistlers the yellow coloration is limited to the nape, where it contrasts with olive upperparts and black head. The underparts are tri-coloured, with a white throat, black breast and orange belly.

[*Pachycephala schlegelii* schlegelii,  
Huon Peninsula,  
NE New Guinea.

Photo: William S. Peckover]



Whistler resemble the female Regent Whistler, differing mainly in the colour of the throat. Another closely related species is the Golden-backed Whistler (*Pachycephala aurea*). This has been recorded from a number of scattered low-altitude localities, and little is known about its natural history. The Vogelkop Whistler (*Pachycephala meyeri*) is known from only a handful of specimens from the Arfak and Tamrau Mountains, in the Vogelkop; it may occur also in the Foya Mountains, but possible sightings there need to be confirmed. This small species may not belong with the Golden Whistler species group, instead being closer to some other monomorphic whistlers.

The Hooded Whistler (*Pachycephala implicata*) is the high-elevation member of this group in the taller mountains of Bougainville and Guadalcanal, in the Solomon Islands. It probably arose from an early invasion of these islands by a Golden Whistler-like ancestor. The Golden Whistler itself has subsequently arrived on the islands and occurs at lower altitudes, co-existing with the Hooded Whistler at some intermediate elevations and being replaced by it at higher altitudes.

West of New Guinea, this species group is represented, in addition to the Golden Whistler, by the Bare-throated Whistler (*Pachycephala nudigula*) of Sumbawa and Flores and the Fawn-breasted Whistler (*Pachycephala orpheus*) of Timor and several neighbouring islands of the Lesser Sundas. The former is similar in appearance to local populations of the Golden Whistler, but is notable for the bare red throat patch of the adult male. The Fawn-breasted Whistler is more or less monomorphic, both sexes having a dull, female-like plumage. Both species are sympatric with the Golden Whistler on their respective islands, but the Bare-throated Whistler is the larger of the two where these occur together, whereas the Fawn-breasted Whistler is the smaller.

Exact taxonomic limits of *Pachycephala* are unresolved, the uncertainty resulting from four species sometimes included in this genus and at other times placed in monotypic genera. Little has been published to explain the reasons for either treatment. Two of these species are restricted to higher elevations in the mountains of Sulawesi, and the other two are from New Guinea. All are whistler-like in general appearance, but have colour patterns not otherwise found in the genus *Pachycephala*. The Mottled Whistler (*Rhagologus leucostigma*) and the Yellow-flanked Whistler (*Hylocitrea bonensis*) have primarily frugivorous diets,

but it is questionable that this has any important phylogenetic significance. Although somewhat at odds with the mainly insectivorous diet of other pachycephalids, fruit-eating has been observed for a number of whistlers, shrike-thrushes and pitohuis. Two other species, the Maroon-backed Whistler (*Coracornis raveni*) and the Rufous-naped Whistler (*Aleadryas rufinucha*), were included in the genus *Pachycephala* in Peters's *Check-list*, but are probably more appropriately placed in monotypic genera. The Maroon-backed Whistler has more prominent rictal bristles, differences in wing structure and bill features, and a colour pattern that is unique in the family. The Rufous-naped Whistler is more robust than many other whistlers, and is also more terrestrial. To regard them all as members of *Pachycephala* may be more indicative of overenthusiastic "lumping" than an accurate reflection of their interrelationships. While nothing has been published to contradict their membership of the Pachycephalidae, resolution of their positions within the family await more detailed study.

No field observer who has heard the songs of a shrike-thrush could mistake them for the sounds made by a whistler, but morphologically it is difficult to define any distinguishing features of the seven *Colluricincla* species. As well as lacking bright colours, shrike-thrushes have a relatively larger bill as a rule, and their sexual dimorphism is very slight. They are larger, somewhat heavier-bodied versions of whistlers but without any of the bright plumage. The legacy of the association made by early ornithologists between these birds and the true shrikes of the Laniidae, coupled with an appearance not unlike that of a *Turdus* thrush, remains in the name of "shrike-thrushes". They are, of course, neither shrikes nor thrushes, nor are they in any sense intermediate between these two groups.

The Little Shrike-thrush (*Colluricincla megarhyncha*) was regarded as being transitional between this genus, as characterized by the thrush-sized Grey Shrike-thrush (*Colluricincla harmonica*), and the whistlers, and it was frequently placed in its own genus, *Myiolestes*. It is a highly variable species, having several subspecies groups throughout lowland New Guinea and in northern and eastern Australia. The majority have plumage in shades of brown and rufous, hence the often used name of "Rufous Shrike-thrush" for most populations, but those on islands off the eastern New Guinea coast stand apart in having an olive-





green back. Also distinctive are the rather pale individuals in northern Australia; this coloration, combined with a pronounced association with mangroves, led to their being long treated as a separate species, "*Colluricincla parvula*". Later revisions of the Australian populations united all as a single species. In view of the range of plumage colours, the name "Rufous Shrike-thrush" was deemed less appropriate than "Little Shrike-thrush", which had until then been applied only to the pale north Australian populations.

There are three closely related forms, including the only shrike-thrushes that occur outside Australia or New Guinea. Originally named in 1881, on the basis of two specimens from Sangihe Island, the Sangihe Shrike-thrush (*Colluricincla sanghirensis*) was later treated as a subspecies of the Little Shrike-thrush. Because there were no subsequent records, it was thought that the specimens had been mislabelled and were of unknown provenance. Rediscovery of this bird on Sangihe in 1985, however, confirmed that it was a valid species, albeit a rare one (see also Status and Conservation). The Morningbird (*Colluricincla tenebrosa*) is found only on the Palau Islands, in Micronesia. It was first described in the genus *Rectes*, later transferred to *Pitohui*, and subsequently placed in the monotypic genus *Malacolestes*, before being identified as merely an insular derivative of the Little Shrike-thrush. The Sooty Shrike-thrush (*Colluricincla umbrina*) was for a long time known as the Sooty Whistler, having first been described under the name of "*Pachycephala tenebrosa*" in 1911. It resembles a much darker version of the Little Shrike-thrush, and was eventually recognized as belonging in *Colluricincla*, near that species. When the Sooty Shrike-thrush is transferred to this genus, however, the name *tenebrosa* is preoccupied by the Morningbird, described in 1868; consequently, it takes the next available name, *umbrina*, given to it in 1915.

Another major subgroup in *Colluricincla* is typified by the widespread Grey Shrike-thrush. A much larger-bodied bird than the Little Shrike-thrush, it is found throughout wooded country in Australia and is undergoing an expansion in parts of New Guinea. It exhibits considerable geographical variation, and until recently much of this was often recognized at the subspecies level. The most recent treatment is to segregate these "races" into major re-

gional groups. Previously, the Grey Shrike-thrush was divided into three species, populations of eastern Australia and Tasmania retaining this name, with "*C. brunnea*", the "Brown Shrike-thrush", in northern Australia and New Guinea and "*C. rufiventris*", the "Western Shrike-thrush", in central, south-central and western Australia. These forms intergrade where they meet. The other large species, the Sandstone Shrike-thrush (*Colluricincla woodwardi*), is, as its name suggests, a specialist on the sandstone escarpments of northern and north-western Australia. It occurs together with the Grey Shrike-thrush in these regions.

Restricted to the highlands of north-east Queensland, Bower's Shrike-thrush (*Colluricincla boweri*) is intermediate between the "megarhyncha group" and the "harmonica group" in size and plumage. Although its natural history has been well studied in the field, little attention has been given to its affinities within the genus.

The six species of pitohui are confined to New Guinea. These birds have been regarded as being little more than oversized shrike-thrushes. They are similar to the latter in shape, although of larger size and with a more robust bill and stronger legs. Only a partial phylogeny of interspecific relationships has been published. Unpublished findings, however, suggest the possibility that this genus is polyphyletic, that all species belong to the Pachycephalidae but have their origins in two or three different places within the family. The etymology of the generic name *Pitohui*, from which the English group name is taken, appears to be a mystery.

The limited molecular information that has appeared indicates that the Variable Pitohui (*Pitohui kirhocephalus*) and the Hooded Pitohui (*Pitohui dichrous*) are sister-species. They both have bold plumage of chestnut and black, and they are sufficiently similar to each other that a close examination is often required in order to distinguish them. Both occur widely through New Guinea at lower elevations, where they present striking contrasts in the degree of geographical variation. The Variable Pitohui earns its name through its possession of a wide range of plumage variations that have led to the description of more than 20 subspecies. With a distribution almost as extensive, the Hooded Pitohui exhibits no such variation and no subspecies are recognized.

Two species with unpatterned rufous plumage are also found in the lowlands and hill country. The Rusty Pitohui (*Pitohui ferrugineus*) is widespread, while the Crested Pitohui (*Pitohui cristatus*) is much more patchy in its distribution. Despite a likeness in appearance, these two species are not necessarily each other's closest relatives. It has been suggested that the White-bellied Pitohui (*Pitohui incertus*) might be nearest to the Rusty Pitohui. The former is one of the least-known New Guinea members of the family, the handful of specimens having been obtained from only two areas of low floodplain. The final member of this genus, the Black Pitohui (*Pitohui nigrescens*), is the only one to be found in the highlands. It has less obvious connections with other members of the genus and differs in several morphological characters.

The Crested Bellbird (*Oreoica gutturalis*) was once placed with the Shrike-tit (*Falcunculus frontatus*), as well as the whipbirds and wedgebills (*Psophodes*), in an artificial grouping, the Falcunculidae, solely on the basis that all possessed a crest. The genus *Psophodes* is currently allocated to the Eupetidae, while a relationship between the Crested Bellbird and the Shrike-tit is, at best, one at the familial level. The Crested Bellbird resembles the Grey Shrike-thrush in size and shape, and the females of these two species are similar to each other in plumage. As a result, the Crested Bellbird is sometimes placed in close association with the shrike-thrushes. Recent molecular-genetic studies, however, hint at a closer relationship with the pitohuis.

The bold black, white, olive and yellow plumage of the Shrike-tit is reminiscent of that of the Golden Whistler and, for want of a better suggestion, the Shrike-tit is therefore also placed in this family. Its voice has none of the ringing musical power of the other members of the group, but, as with the whistlers, the chicks have a rufous tinge to the plumage. It is the odd laterally compressed bill and the unusual foraging habits that have attracted most attention. Similar bill morphology and feeding habits have arisen in the smaller Wattled Ploughbill (*Eulacestoma nigropectus*) of New Guinea.

Whilst several whistler species are well known for the bright yellow in their plumage, the majority are rather drably coloured, being garbed in brown, olive and grey. A case in point is the Mangrove Whistler. Both sexes of the nominate race, which ranges from north-east India through Indochina to the Greater Sundas, are effectively "hen-plumaged". They have a pale grey forehead and lores, ashy brown head, ashy upperparts and white underparts with a grey breast. The nominate race, in particular, is associated with mangroves.

[*Pachycephala cinerea cinerea*, Mun Nork Island, Rayong Province, Thailand.  
Photo: Suppalak Klabdee]

Sexual dimorphism is not rare in Pachycephalidae, but it ranges from being quite marked to almost indiscernible. Plumage differences are the most common form, but variation in size or bill colour, and the presence or absence of peculiar bare parts, are other versions. In the dull-coloured species, plumage differences between the sexes are minimal. In the bright-coloured species, typically some of the Pachycephala whistlers, they can, however, be quite striking. A good example is the **Golden Whistler**. In most of this species' 59 races, the female (above) is broadly dull olive, brown or grey in coloration. In contrast, the male (below) is often boldly patterned with black, white, yellow and olive. In addition to sexual differences, there is substantial variation among subspecies over the Golden Whistler's wide range. There are also differences in body size and bill dimensions. Male plumage varies in the colour of the crown, mantle, throat and tail, and in the presence and/or colour of nape collar and breastband. Female variation is more subtle, normally involving the amount of yellow or olive in the plumage. The extent of these differences means that the Golden Whistler provides one of the most complex examples of geographical variation among birds.

[*Pachycephala pectoralis youngi*.

Above: Brisbane Ranges, Victoria, Australia.

Below: Anglesea, Victoria, Australia.

Photos: Peter Fuller]





The Shrike-tit comprises three allopatric populations, which have at various times been accorded species status, the nominate race as the "Eastern Shrike-tit", *whitei* as the "Northern Shrike-tit" and *leucogaster* as the "Western Shrike-tit". There are some moderate differences in plumage and proportions. The northern and western forms are smaller, with the wings perhaps somewhat more pointed. Northern birds have a relatively shorter tail, and the wings and upperparts are much yellower; the belly of western birds is white. Differences in foraging have been reported, but these may be strongly correlated with regional vegetation features. Whether these contrasts with the nominate race are indicative of species-level divergence is uncertain, and resolution of the status of these taxa awaits a genetic examination.

Despite the recent practice of treating the Shrike-tit and the Wattled Ploughbill as associates, primarily because of their shared bill morphology, other evidence for such a relationship has not yet been forthcoming. Apart from their bill shape, which is a result of the similar modes of feeding, adults of the two species are similar in colour scheme, although not in pattern, but they have little else in common. Juveniles of both have rufous in the plumage, but this is more important in indicating a relationship with the general whistler assemblage.

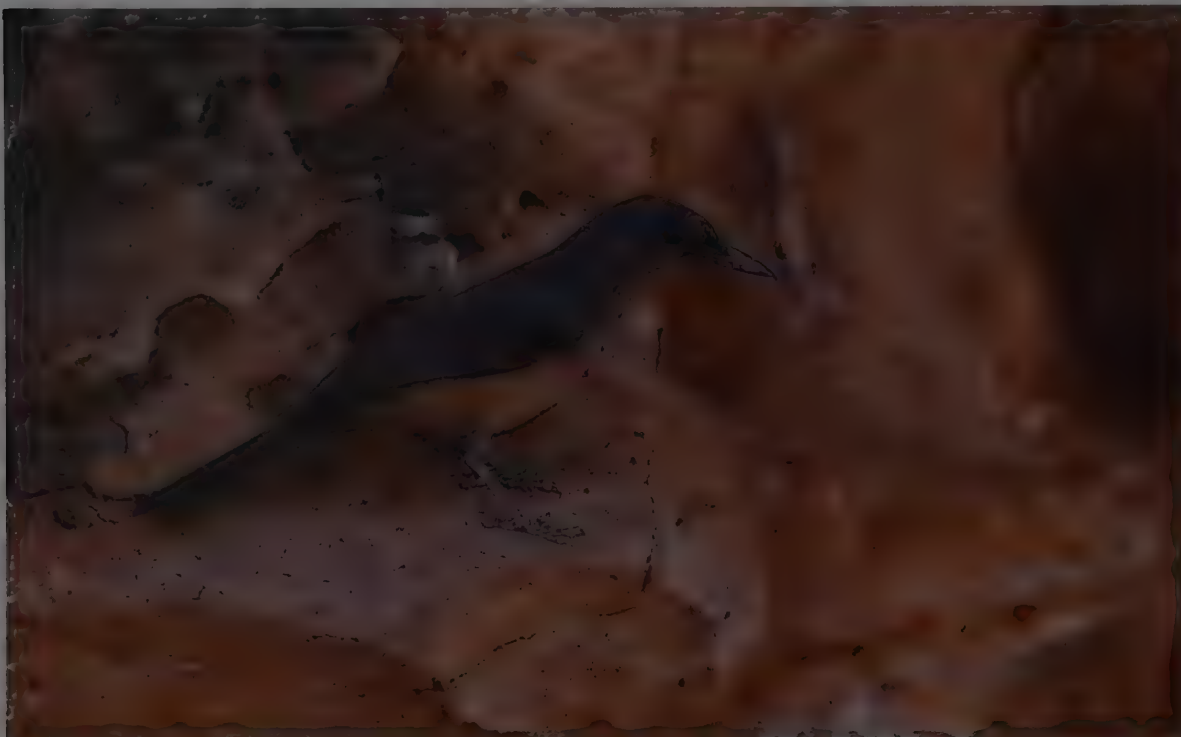
Although the Goldenface (*Pachycare flavogriseum*) of New Guinea is sometimes called the "Dwarf Whistler", its affinities are uncertain. It is placed in the present family meantime somewhat by default, largely for want of good evidence to transfer it elsewhere. The bright yellow underparts and the strong voice perhaps offer some evidence of a relationship with the whistlers, but other plumage characters, as well as behaviour, indicate less of a connection. An alliance with the Australasian robins in Petroicidae has also been suggested. The nest is particularly unlike those of other pachycephalids or those of petroicids. The closest relatives of the Goldenface may well be sought elsewhere, perhaps among the thornbills of the family Acanthizidae, some members of which have nest architecture similar to that of the Goldenface.

Inclusion of the New Zealand endemic genus *Mohoua* in the Pachycephalidae is a comparatively recent action. The three species have at various times been placed uncomfortably with the tits and chickadees (Paridae), the babblers (Timaliidae), the logrunners (Orthonychidae), the cuckoo-shrikes (Campephagidae), the Old World warblers (Sylviidae), the fairywrens (Maluridae) and the thornbills. A. Keast suggested a relationship with the whistlers on the grounds of similarities between them in

bill and nostril shapes, plumage colours and patterns, and nest structure. These characters, however, are all strongly prone to convergence, and do not therefore provide an especially compelling argument. C. G. Sibley and J. E. Ahlquist applied the techniques of DNA-DNA hybridization to the question. They obtained a cluster of typical pachycephalids together with *Mohoua* and the Australo-Papuan sittellas (*Daphoenositta*), which they referred to the subfamily Pachycephalinae of an enlarged Corvidae. When the sittellas were removed to their own family, the association of *Mohoua* with the conventional pachycephalids persisted. S. L. Olson examined the osteology of this genus and concluded that, while its relationships were unclear, it could not be referred to the Pachycephalidae nor to any other member of the corvine assemblage. This view was supported by a reanalysis of the DNA-DNA hybridization data. So, although the current arrangement is to retain *Mohoua* in Pachycephalidae, it is largely a matter of convenience and recent practice. The situation could well prove to be similar to that of other New Zealand endemic passerine genera, such that *Mohoua* may have its own separate lineage and should not be "shoe-horned" into another, existing family. Collectively, the three species are referred to as "mohouas".

For a long time the New Zealand Brown Creeper (*Mohoua novaeseelandiae*), sometimes called the "Pipipi", was placed in a monotypic genus, *Finschia*. Olson, however, found no osteological basis for separating it from *Mohoua*, and his view has been accepted ever since. The two other species in the genus, the Yellowhead (*Mohoua ochrocephala*) and the Whitehead (*Mohoua albigilla*), are restricted to the South Island and the North Island, respectively. In Peters's *Check-list* they were regarded as subspecies of the same species, but the osteological data, as well as marked size differences, indicate that they are quite distinct. These three species exhibit a specialization in the hind limb for foraging, the degree of this specialization increasing from the New Zealand Brown Creeper through the Whitehead to the Yellowhead.

Another candidate as a member of this family is the recently extinct genus *Turnagra*, containing the Piopio, a Maori name derived from the species' voice. The genus is sometimes referred to as the "New Zealand thrushes", a poor name as it has nothing to do with the true thrushes of the family Turdidae. The populations on the North Island, constituting the taxon *tanagra*, and those on the South Island have been conventionally treated as belonging to a single species, *T. capensis*, but the differences in plumage and bill proportions suggest that they are better regarded as two dis-



The Colluricincla shrike-thrushes are larger, heavier-bodied versions of the Pachycephala whistlers, but without the bright colours. While not related to either shrikes (Laniidae) or thrushes (Turdidae), this genus has morphological and behavioural characteristics reminiscent of both: usually being long-tailed, long-winged and long-billed; and often foraging on or near the ground. Bill and tail lengths are taken to extremes in the Sandstone Shrike-thrush, a specialist of the sandstone escarpments of northern and north-western Australia.

[Colluricincla woodwardi, Australia.  
Photo: Roland Seitre]

The six species of pitohui (Pitohui) are similar in shape to the shrike-thrushes (Colluricincla), but are larger, with a thicker bill and stronger legs. All six species have some rufous in the plumage of one or both sexes. The most boldly patterned are the Hooded Pitohui and Variable Pitohui (Pitohui kirhocephalus). These sister-species are so similar in appearance that careful scrutiny is often required to tell them apart. The adult Hooded Pitohui is bicoloured, with black head, throat and wings set off by the rufous-chestnut nape, mantle, breast, belly and vent. The juvenile is similar, but has wing and tail feathers edged brown.

[Pitohui dichrous,  
Crater Mountain,  
EC New Guinea.

Photo: William S. Peckover]



tinct species. Unfortunately, neither form has been reliably recorded since the early part of the twentieth century.

Once a relationship with the thrushes was dismissed, subsequent authors have associated *Turnagra* primarily with either the whistlers or an assemblage containing the bowerbirds (Ptilonorhynchidae) and the birds-of-paradise (Paradisaeidae). Olson and his colleagues compared proportions, external morphology, plumage, pterylosis, myology and overall skull morphology, and found similarities between piopios and the latter assemblage in general, and between piopios and the cnemophiline birds-of-paradise in particular. There was little support for a relationship between whistlers and piopios. DNA analyses by L. Christidis and co-workers suggested a close affinity with the bowerbirds, and these authors recommended that *Turnagra* be retained in its own family and be placed next to the bowerbirds in a linear sequence. R. Schodde and I. J. Mason rejected these conclusions, and regarded the piopios as part of the pachycephalid assemblage on the basis of juvenile plumage and of certain skull characters not cited by Olson. Another possibility is that *Turnagra* is a very old lineage with no close living relatives. Obviously, its relationships remain to be determined with confidence. The genus is now considered to be extinct (see HBW 7, pages 52–53).

The classification set out in the most recent edition of the *Howard and Moore Complete Checklist*, published in 2003, makes substantial changes to the traditional family composition as outlined in the preceding paragraphs. The shrike-thrushes, the pitohuis and the Crested Bellbird have been segregated in a family Colluricinclidae, while the Shrike-tit and the Wattled Ploughbill are removed to the Falcunculidae. The remaining species, with the exception of the three mohouas, are retained in Pachycephalidae. In the linear sequence, this narrowly circumscribed family follows Falcunculidae, but Colluricinclidae is well removed from both. *Mohoua* is treated as part of Acanthizidae. To date, no evidence has been published to support this novel arrangement. No extensive revision of the family, using either traditional morphological characters or molecular approaches, has been carried out. The snippets of DNA-based results that have appeared have often been contradictory, and the findings of research as yet unpublished are further at variance.

There is evidence that the Pachycephalidae as conventionally constituted is not a natural group. It is not always clear, however, which members do not belong in it. A close association between whistlers and shrike-thrushes is supported by some studies, but not by others, which place the latter group with the pitohuis, and away from the whistlers. The Crested Bellbird may be closer to the pitohuis than to the shrike-thrushes. The Mottled and Rufous-naped Whistlers, each in a monotypic genus, are not particularly close to the core members of *Pachycephala*, and also more distant are the Shrike-tit and the Wattled Ploughbill.

Unfortunately, most of the studies hitherto undertaken have included only a few representatives of the family, and some species have not yet been examined in any comparisons. There is clearly scope for much additional work on these interesting birds, and it seems highly likely that further molecular-genetic research and analyses will result in a radically different classification from the current one.

## Morphological Aspects

On account of the large rounded head, a number of these birds used to be known as “thickheads”, in a literal translation of the genus name *Pachycephala*. They are now known, equally distinctively but more attractively, as whistlers. Members of this family range from small-bodied species to medium-sized passerines. The smallest are the New Zealand Brown Creeper, the Goldenface and the Wattled Ploughbill, all about 12–13 cm in length and weighing about 13 g. Whistlers vary in size, from the Vogelkop and Grey Whistlers, at 14 cm, to the White-breasted Whistler, some island populations of the Golden Whistler and the Rufous-naped Whistler, which are up to about 20 cm long and 44 g in mass. Falling into the latter size range is the Little Shrike-thrush, while larger shrike-thrushes and the Crested Bellbird run to 23–25 cm and 60–75 g, as do the smaller pitohuis. The largest member of the family is the Rusty Pitohui, which reaches 28.5 cm in length and 110 g in weight.

Larger-bodied birds generally have more robust legs and feet. In the case of the pitohuis, the Crested Bellbird and the larger whistlers and shrike-thrushes, the legs are, indeed, strongly de-



veloped. A similar relationship holds for the bill. Most members of the family have a bill that is sturdy, with a pronounced tomial notch and terminal hook. This hook is often small, but it can be proportionately large on some species, regardless of the body size, as demonstrated by, for example, the small Goldenface and the comparatively massive Variable Pitohui. The hook is rather frequently lost, and this can substantially change the nominal length of the bill. The nostrils usually lie at an oblique angle to the tomium, but on the Maroon-backed Whistler they are parallel with the tomium. The general bill structure as outlined here is found in most pachycephalids, but the proportions vary, the bill of many whistlers being short and rather stubby and that of shrike-thrushes and pitohuis medium-length to long and rather heavy. The *Mohoua* species, namely the New Zealand Brown Creeper, the Yellowhead and the Whitehead, have the hook almost absent and the bill of these three is more warbler-like. The specialized bills of the Shrike-tit and the Wattled Ploughbill are laterally compressed, and disproportionately deep for their length, giving them a wedge shape. This peculiar structure earned the Shrike-tit the early colloquial name of "falcon-shrike", perhaps from an incautious person who suffered its rather fierce bite.

The shortest bill is that of the New Zealand Brown Creeper, just reaching 12 mm. Among the whistlers, bill length can be quite variable, ranging from 15 mm to 25 mm. The longest bills, measuring 30–35 mm, are found on the Sandstone Shrike-thrush and the Variable Pitohui. One of the shortest bills in relation to the bird's size is that of the mainland Australian Golden Whistler, the bill length of which is equivalent to only 16% of the wing length. The Little Shrike-thrush, appropriately named *megarrhyncha*, and several pitohuis have bills that are equal to 25% or more of the wing length. For its size, however, the Goldenface possesses the longest bill, measuring 29% of the wing length.

With regard to bill width, as measured at the rear of the nostrils, the smaller-bodied forms usually have the narrowest bill and the largest pitohuis the broadest bill. As might be expected, a similar relationship holds for bill depth. These raw figures, however, do not really give a good indication of bill shape. Using a combination of width and length, the Golden Whistler has one of the broadest bills for its length and the Little Shrike-thrush one

of the narrowest. A rather narrow bill is exhibited also by the Shrike-tit, but the unusual shape of this species' bill becomes particularly obvious when the depth is compared with the length. Most species in this family have a ratio of bill depth to bill length in the range 2.6–3.5, the Crested Bellbird reaching a figure of 4.2. In contrast, the Shrike-tit and the Wattled Ploughbill have a ratio of 5.1–5.6, reflecting the deep, laterally flattened bill of these species. This is apparent also in the depth-to-width ratios: 0.8–1.2 in most pachycephalids, but exceeding 1.5 in the Shrike-tit and Wattled Ploughbill, and occasionally reaching 2.2 in some males of the former.

Rictal bristles are generally short in pachycephalids, but those of the Black Pitohui are strongly developed. The Maroon-backed Whistler, too, has more prominent bristles, one of the characters on which this species has been segregated generically from *Pachycephala*.

Wing length is another indicator of overall size. At the lower end, the wing of the Goldenface measures 62–64 mm, and those of the Wattled Ploughbill and the New Zealand Brown Creeper are only slightly longer. There is a progression in size, the wing lengths of the largest whistlers overlapping those of the smaller shrike-thrushes, while the large shrike-thrushes overlap the lower end of the length range of pitohuis. The longest wing, at 140 mm, is that of the Rusty Pitohui.

Most pachycephalids have short, broad wings, with ten primaries and nine secondaries. That the wings are rounded is not surprising, given the rather deliberate foraging movements of these birds and the sedentary nature of most. A few species have more pointed wings. These include, not unexpectedly, the Rufous Whistler, the foraging behaviour of which incorporates more sallying than does that of other species; it is also the most migratory whistler (see Movements). Two closely related species, the White-bellied and Black-headed Whistlers, have similar wing shapes, and they feed in a manner similar to that of the Rufous Whistler, but they are far more sedentary. Foraging behaviour appears, therefore, to be more important in determining wing shape than does the extent of movements undertaken. The Yellow-flanked Whistler, too, has a pointed wing, with a relatively large outer primary, but its feeding techniques are poorly known.



The **Crested Pitohui** is one of only two pitohuis with unpatterned rufous plumage. Both sexes look the same, being broadly rufous-brown on the crown, mantle, wings and tail and a paler, more washed-out chestnut on the sides of the neck and the underparts. The juvenile is similar, but duller and duskier with a paler bill. The Crested Pitohui is unique within its genus, though not in the family, in having a highly apparent erectile crest. Its noticeably thick legs are suggestive of an adaptation to terrestrial life, and, indeed, this species probably spends more time foraging on the ground than any of its congeners.

[*Pitohui cristatus*  
kodonophonos,  
Sogeri Plateau,  
SE New Guinea.  
Photo: Brian J. Coates]

There are twelve rectrices in the pachycephalid tail, which is characteristically square-ended or with a slight V-shaped indentation in the centre. Mohouas have somewhat rounded tips, with the ends of the rectrices curved slightly downwards. Tail lengths vary. Most are equivalent to 70–85% of the wing length, but the corresponding figure reaches 90–97% in the case of the New Zealand Brown Creeper, the Sandstone Shrike-thrush, the larger whistlers and the Variable Pitohui. At the other end of the spectrum is the Goldenface. Its tail slightly exceeds 40 mm in length, and even for this small species is proportionately short, no more than 65% of the length of the wing. Although the rectrices are often narrowly edged with a variably paler colour, usually similar to that of the back, pronounced markings such as prominent white tips are absent except in the case of the Tongan Whistler, which has a yellow-tipped tail.

An erectile crest is present on both sexes of the Shrike-tit and the Crested Pitohui. The male Crested Bellbird has a crest of elongate black feathers along the centre of the crown from the forehead to the nape; the female has similar feathers but, unlike the male, apparently cannot erect these.

The adult plumage of many members of the family displays rather dull or drab colours, often with little patterning. These colours are reflected in the species' English names, as, for example, in Grey Whistler, Black Pitohui, Brown-backed Whistler, Olive Whistler and White-bellied Pitohui. The same is true for several species that are extensively or completely rusty orange or rufous in colour, such as the Rusty Whistler, the Rusty Pitohui and the Rufous Whistler. The odd dorsal colour of the Maroon-backed Whistler is unique within this family. Various shades of greenish or yellowish-olive are found on many species, and particularly on the back, as illustrated by the Shrike-tit, the Rufous-naped Whistler, the Green-backed Whistler, members of the Golden Whistler species group, and south-eastern New Guinea subspecies of the Little Shrike-thrush.

The underparts can have streaks ranging from very fine to moderate and to heavy, and most often confined to the throat and breast. In colour, the underparts can resemble the upperparts in general tone, although they are normally somewhat lighter. When species are much brighter on the underside, the colour is usually

yellow. Many of these yellow-bellied forms have distinct patterning of the head, neck and upper breast. This pattern, although not the bright colour, is found also in the Rufous Whistler group.

Other than these, plumage patterns in this family are for the most part simple. The unusual markings on the upperparts and underparts of the female Mottled Whistler give this species its vernacular name. Wingstripes are absent, the most ornate wing pattern comprising a single spot on the tip of each tertial of the Goldenface. One of the most striking patterns, but nonetheless a simple one, is the black-and-brown "wasp" coloration of the Hooded and Variable Pitohuis, which in this case may serve as a warning signal, as these birds are poisonous (see end of this section). Other than that described above, the pachycephalid head is generally unpatterned. Exceptions are the bold black and white stripes on the face and crown of the Shrike-tit and the contrastingly coloured loreal spots on the Samoan Whistler and a few other species.

The bright yellow underparts are very characteristic of the Golden Whistler and closely related species (see Systematics). The nominate race has a black crown and face, a yellow nuchal collar, olive-green upperparts, a white throat, a black breastband and yellow breast, belly and undertail-coverts. While there is variation among the species in the Golden Whistler group, its extent is exceeded by that within the Golden Whistler itself. The "typical" Golden Whistler was described above, but different states of colour and development of plumage features occur in a range of combinations. The extent of this variation cannot be appreciated without a comparison of representative subspecies throughout the species' wide distribution.

In the Moluccas, the subspecies of the Golden Whistler on Tidore and Ternate, *tidorensis*, has a typical male plumage but extra-long throat feathers, which obscure the band on the breast and often cover it at the ends, where it meets the ear-coverts. Some subspecies resemble those of Australia, except for a conspicuous rufous wash through the yellow underparts; this characterizes males on Sumbawa and Sumba, in the Lesser Sundas, and is also found on the New Caledonian Whistler, formerly treated as a subspecies of the Golden Whistler. South of Sulawesi, on the small islands of Tanahjampea, Kalaotoa and Madu, the

The shortest bill of any pachycephalid belongs to the **New Zealand Brown Creeper**. Like the other two members of Mohoua, it has a warbler-like bill, and the hooked tip characteristic of the family is virtually absent. All three have a specialization in the hind limb for foraging.

Sizewise, this trio is at the smallest end of the pachycephalid spectrum. Rather large-headed and slim-bodied birds, they have a long, slightly rounded tail, grey-brown upperparts and either white or yellow underparts. The genus *Mohoua* is included in *Pachycephalidae* as a result of convenience and recent practice. Genetic and osteological analyses have yet to shed light on its true taxonomic affinities.

[*Mohoua novaeseelandiae*,  
Ulva Island Bird Sanctuary,  
Stewart Island,  
New Zealand.  
Photo: Tui de Roy/  
The Roving Tortoise]





yellow collar is reduced and the back is variably mottled with black, while on Halmahera the collar is absent. The males of a number of Golden Whistler populations, including many in the Solomons, have yellow throats, making the entire underside yellow except when a dark breastband is present. In the Tanimbar Islands, males have a black breastband and a dark olive collar, whereas on Bougainville they have the breastband very broad but lack the collar. Moving south through the Solomons, Malaita males lack the breastband, and the yellow collar varies from very broad to non-existent. In Fiji, Viti Levu birds of the race *graeffii* have neither a collar nor a breastband, but their lores are yellow. A high level of intra-population variation is present on Rendova, in the west Solomons, where Golden Whistlers have no collar and the breastband may be broad to very broad. In these birds, there is often extensive black in the plumage, particularly on the wings and flanks, and individually on the back, which varies from dark olive to completely black. A few individuals are entirely black.

A few Golden Whistler populations have feminized male plumages. In other words, the males resemble the females of the subspecies more than they do males on other islands. Those on Norfolk Island are drab, with little other coloration. The unusually plumaged males of Rennell Island are duller than most males but brighter than most females. They lack a breastband and collar, and they have the underparts light yellow, and the olive upperparts and wings strongly marked with rufous. The odd appearance of this race, *feminina*, is enhanced by its having a pale bill, rather than a black one as that of other whistlers.

To add to the complexity of the Golden Whistler, females have their own diversity of plumage variation, more or less uncorrelated with that of males. The females breeding in south-eastern Australia have plumage largely of shades of grey, whereas those in more northerly parts of the mainland have an olive wash through the upperparts, buffy underparts and yellow undertail-coverts. This latter plumage is approached by some island populations, such as on Viti Levu, where females are similar but have much more strongly mottled underparts. On Halmahera, the female has a lightly mottled off-white throat, but the remainder of the underparts are a dull yellow. A number of scattered populations, such as those on the Moluccan island of Obi, in the Snow Mountains of New Guinea, on Manus in the Admiralty Islands, and on Utupua in the Santa Cruz Group, have similar

females except that the yellow is quite bright; on Utupua, the breastband is cinnamon and the upperparts olive-brown. Females from Malaita resemble those of north-eastern Australia, having an olive back, off-white underparts and yellow undertail-coverts, except that the remiges and wing-coverts are broadly edged with rufous, giving the folded wing a distinctly reddish appearance. As with the males, Rendova females are quite variable: the underparts are bright yellow with fine streaking, while the upperparts range from dark olive through to black and the dark brown breastband may be narrow, broad or absent. On several islands, such as Santa Cruz and Kandavu, the underparts are fawn, varying in intensity, acquiring a pronounced cinnamon tinge in places; the upperparts range from olive to olive-brown and olive-grey.

Many juvenile pachycephalids are extensively rufous. This colour is sometimes largely restricted to edging on the feathers or a reddish-brown tinge in the rest of the plumage, but in other cases, as with the Golden Whistler and its close relatives, the juveniles are entirely rufous. Among other Australasian songbirds, this juvenile coloration is found only in the robins of the family Petroicidae. Its shared presence is one character that has been cited to link the Shrike-tit and the Wattled Ploughbill. Several groups in the Pachycephalidae are characterized by the fact that the juveniles have some light rufous edgings on the wing feathers but are otherwise heavily streaked on the underparts, as illustrated by the Rufous Whistler and the Grey Shrike-thrush. Juveniles of the pitohui and mohouas resemble the adults in plumage.

The presence of distinctive juvenile coloration allows the plumage sequence to be determined through several moults. The juvenile plumage of the Golden Whistler is retained for only a short period and that of the Grey Shrike-thrush for somewhat longer. All species studied appear to undergo a partial post-juvenile, or first pre-basic, moult shortly after fledging, whereby the body feathers are quickly replaced and the remiges, greater secondary coverts and rectrices are retained. The retained juvenile coverts and broadly pale-edged secondaries form a conspicuous patch on the closed wing of the Golden Whistler and other species, permitting easy identification of such individuals as first immatures. Males of sexually dimorphic species tend to have delayed plumage maturation, with a female-like plumage when immature. Some, such as the Shrike-tit, attain adult male plumage in the second year, whereas for others, such as the Rufous Whistler, this does not happen until the third year.



Several pachycephalids are known to bathe, and most probably do. The *Rusty Pitohui* spends most of its time foraging in the lower canopy, but this one has descended to the ground to freshen up. Bathing helps to keep the feathers in excellent condition. Once in the water, a bird will fluff its feathers to expose the bare skin between the feather bases, submerge its breast and belly, dip its head in the water, roll vigorously back and forth, and create a shower by flicking its wings in and out of the water. Typically, the bird repeats the sequence, submerging further each time until all the feathers are soaked.

[*Pitohui ferrugineus clarus*, near Brown River, SE New Guinea. Photo: Brian J. Coates]

The **Brown-backed Whistler** is one of the smallest members of its genus. This individual is stretching its wing, perhaps having just taken a break from foraging in order to preen. The main purpose of preening is to recondition feathers, often involving repairs in which loose barbules may be joined on again to zip up any splits. Birds also preen to waterproof and recondition feathers, picking up oil from the preen gland near the base of the tail and then rubbing it over their feathers. Uropygial oil is thought to have antibacterial, antifungal and antiparasitic properties that inhibit parasites, so preening also plays a role in removing harmful organisms from the plumage.

[*Pachycephala modesta hypoleuca*,  
Mount Hagen,  
E New Guinea.  
Photo: Brian J. Coates]



Early ornithologists were not aware of this plumage transition, and some purported species were named on the basis of the rufous wings. For example, "*Pachycephala rufipennis*" was found to be, in fact, an immature of the Grey Whistler. This plumage and all subsequent ones are replaced in a complete moult. The primaries and rectrices are moulted outwards at this time. Males of dimorphic species acquire a second immature plumage, which is little different from that of the adult female. Younger females usually proceed from the first immature directly to the adult plumage. In the case of the Grey Shrike-thrush, this stage is separable from the adult; this species, like the Rufous Whistler and Australian populations of the Golden Whistler, does not gain the adult male plumage until after its third moult. Species without sexual dimorphism may require only two moults. For most pachycephalids, however, detailed plumage sequences have not been worked out. Matters are further complicated because many island populations of the Golden Whistler have retained some of the rufous feathering as part of the adult plumage. Reddish edging on the remiges is characteristic of several subspecies that occur in the Solomon Islands.

Sexual dimorphism is of frequent occurrence in this family, but it ranges from being marked to being almost indiscernible. When present, it is usually expressed in sexual plumage differences, but it may also involve size or bill colour, or, in a few unusual instances, the presence of peculiar bare parts. Plumage differences between the sexes are normally minimal in the more drably coloured species, but often striking in many of the more brightly coloured whistlers. In the case of the Whitehead, it is sometimes possible to differentiate the members of a pair when they are together by the slightly greyer wash of the male, but lone individuals can rarely be identified to sex with any degree of confidence. Sexual differences in the Grey Shrike-thrush are somewhat subtle and involve changes in both plumage and bill colour; combined with age-related plumage changes, these allow identification of age-class and sex until the fourth plumage. The Mottled Whistler, Regent Whistler, Crested Bellbird and Black Pitohui all exhibit pronounced plumage differences between the males and females.

A few species exhibit dimorphism in bare parts, as well as in plumage. The male Bare-throated Whistler is similar in plumage to the Golden Whistler, but it has the throat region unfeathered, exposing the bare red skin. Females of the former lack this bare throat patch and generally resemble female Golden Whistlers. The wattles of the Wattled Ploughbill are found only on the adult male; these red, rounded flaps hang from the side of the face, just behind the gape and below the loreal region. A striking example of sexual difference in bill size is presented by the Shrike-tit. The male's bill, with a mean length of 14.3 mm and an average depth of 11.2 mm, is significantly longer and deeper than the female's, for which the corresponding figures are 12.6 mm and 9.5 mm, respectively.

Adult male Samoan Whistlers show polymorphism in the colours of the forehead and throat. Both may be white, or both yellow, or the forehead may be yellow and the throat white. In addition, the sides of the forehead can be either yellow or white.

Just as they exhibit striking plumage variation, the subspecies of the Golden Whistler also vary considerably in body size and bill size across the species' range. There is a difference between some populations of almost 20 mm in wing length and 5 mm in bill length, while some populations are twice as heavy as others. As examples, the Banks Islands subspecies has a wing length of 86 mm, whereas in the Solomons the wing of the Guadalcanal race measures 105 mm; equally, the Kandavu race in Fiji weighs 25 g, contrasting with the Choiseul race in the Solomons, which weighs 58 g.

The osteology of this family has been studied only in a rather general fashion, and little attempt has been made to place this in a phylogenetic framework. In structure, the whistlers and shrike-thrushes are generally similar to related members of the corvid assemblage (see Systematics). The temporal fossa is rather small and elliptically rounded in most species, although the Mottled Whistler and the pitohuis diverge somewhat from this pattern. The postorbital and zygomatic processes are thin. More divergent are the forward-projecting postorbital process in the Wattled Ploughbill and the downward-pointing one in the Shrike-tit,





One of Australia's most remarkable bird sounds is the song of the **Crested Bellbird**. As the species' English name suggests, its song has a ringing quality that recalls the sound of a cowbell or of a stone being dropped into water. The song starts softly with monotone opening notes. It then intensifies with the final three notes being bell-like and the last being lower and liquid. While singing, the Crested Bellbird alters the direction in which it is facing as it changes volume. The resulting ventriloquial outpouring can make the songster difficult to locate—unless it has chosen an exposed perch like this bird!

[*Oreocitta gutturalis*  
*gutturalis*,  
Hattah-Kulkyne National  
Park, Victoria, Australia.  
Photo: Andy & Gill Swash]

Crested Bellbird and Rufous-naped Whistler. The large ectethmoid extends laterally as far as the jugal bar. Its fusion with the frontal is quite extensive, to the point that the ectethmoid foramen is little more than a single small opening. Other than in the Mottled Whistler and some species of pitohui, the lachrymal is absent. The maxillopalatine processes are usually broad and flat, the palatines have narrow medial shelves, and the transpalatine processes are acute. The shape of the tip of the vomer is variable: in whistlers the margins are curled or there are small horns, whereas in shrike-thrushes the horns are larger and more structurally complex. The nasal bars are usually slender, except in the Rufous-naped Whistler and some pitohuis. The internasal septum is lightly ossified; the extent varies, but it is intermediate between the condition found in the monarch-flycatchers (Monarchidae) and that in the Australasian robins.

As with other members of this passerine assemblage, the humerus has a single tricipital fossa on the proximal end of the humerus. This is pneumatic, with extensive trabeculation. The Pachycephalidae is one of the few families in this assemblage that possess a dentiform process on the carpometacarpus. Even within the family, this is restricted to the shrike-thrushes and the Shrike-tit, being one of the few obvious differences between the shrike-thrushes and the *Pachycephala* whistlers.

Finally, an unexpected finding with regard to this family was the discovery of toxins in the tissues of pitohui species. There were hints of this in the writings of early authors and in the indigenous knowledge of New Guinea peoples, the latter reporting that these birds were unpleasant to eat and were consequently avoided by hunters. While preparing specimens of pitohuis, J. Dumbacher and his colleagues noted that they suffered localized numbness in the fingers, burning in the mouth and nasal passages, and bouts of sneezing. They extracted the chemicals responsible for these reactions and found that they were homobatrachotoxins, a family of toxins previously known only from the arrow-poison frogs (*Phylllobates*) of South American. The concentration of the chemicals was strongest in the feathers and skin, less so in the striated muscle and least in the viscera. Although the most poisonous individual pitohuis carried enough toxin to kill a number of white mice (*Mus*) when it was injected into them, the total amount was about three orders of magnitude less than that in the frogs.

It was first suggested by Dumbacher that these toxins afforded protection against predators. Other authors argued that the concentration was possibly too low to be effective and, in any case, avian predators could kill pitohuis without making sufficient contact with the poisons to be repelled in time. They proposed that it was more likely that the toxins served to inhibit ectoparasites, and subsequent tests supported this notion. The two ideas are not mutually exclusive. Human predators have learnt to avoid pitohuis, and presumably so, too, would other predators, such as snakes.



As one might guess from the name, whistlers are renowned for their strong and distinctive voices. Song bouts may last for 15 minutes, and can be heard 300 m away. Songs of individual species differ, but are sufficiently similar in quality to be instantly recognizable as a pachycephalid. Most comprise a series of loud, clear whistles, varying in volume and speed. The **Rufous Whistler** has a complex outpouring with many song phrases in multiple combinations. Pairs duet, and two birds may engage in "conversational song", vocalizing in tandem.

[*Pachycephala*  
*rufiventris* *rufiventris*,  
near Brisbane,  
SE Queensland, Australia.  
Photo: Brian J. Coates]

The songs of the three mohouas (*Mohoua*) are amongst the least complex of the *Pachycephalidae*. They have a variety of trills, whistles and warbles that call to mind those of a canary (*Serinus*), but each species has its own take on this general theme. The song of the **Whitehead** is a descending, bell-like trill, whereas the **Yellowhead** (*M. ochrocephala*) utters half a dozen musical, trilled notes. In the **New Zealand Brown Creeper** (*M. novaeseelandiae*) the sexes have separate songs, the male's comprising loud whistles and harsh notes, the female's consisting of rapid, brief notes; pairs frequently duet.

[*Mohoua albicilla*,  
Tiritiri Matangi Island,  
off North Island,  
New Zealand.

Photo: Clifford & Dawn Frith]



The concentrations of these chemicals are greatest in the Hooded Pitohui and only a little lower in the Variable Pitohui. The other species have much less of the toxin, which in some instances was so negligible that it could barely be detected. The fact that the Hooded and Variable Pitohuis contain high levels of the chemicals raises the possibility that their strongly patterned rufous-and-black plumage is a warning (aposematic) coloration. There are many confounding factors, such as variation among different populations, particularly differently coloured subspecies of the Variable Pitohui, and variation in age-classes and among individuals from a single site.

Similar compounds were later discovered in another New Guinea species, the Blue-capped Ifrit (*Ifrita kowaldi*). This is a bird of uncertain affinities; although some aspects of its skull morphology resemble those of the *Pachycephalidae*, it almost certainly is not close to this family. It is currently placed, albeit uncomfortably, in the family Eupetidae.

The homobatrachotoxins are not manufactured by the birds themselves, but appear to be sequestered from food items. Dumbacher nominated melyrid beetles of the genus *Choresine* as the source. Several species of this beetle co-occur with these birds in New Guinea and are noted by the locals as producing similar sensations on the skin, mouth and eyes. These findings raise many interesting questions that can be resolved only with further fieldwork.

## Habitat

All members of this family occupy wooded habitats. Rainforest is home to the highest number of species, a tendency stemming from forms occurring in New Guinea and the Pacific, Wallacean and Philippine islands. Within Australia, the situation is markedly different, with most wooded habitats, from rainforest to arid-zone scrub and mangroves, home to at least one *pachycephalid* species.

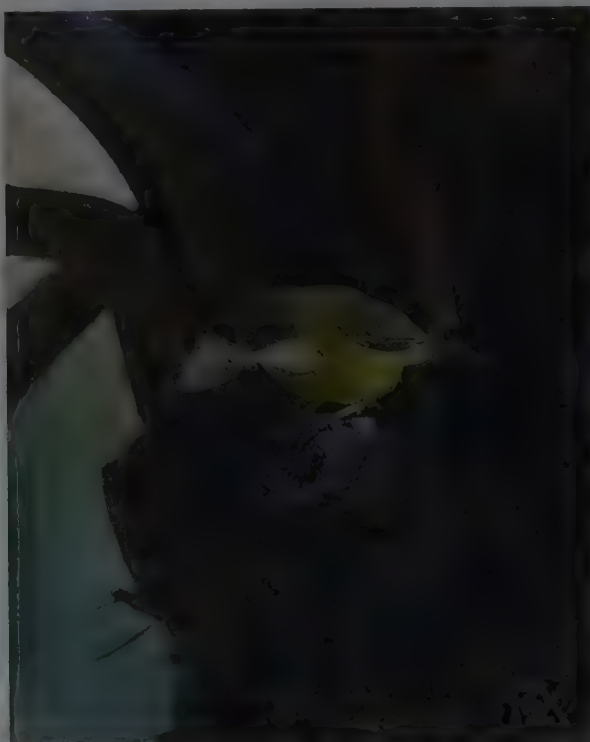
Subtropical and tropical rainforests of eastern and northern Australia harbour the Little and Bower's Shrike-thrushes, while the temperate rainforests of the south-east support the Olive Whistler. Eucalypt forests range from humid types along the coasts to increasingly drier types in inland districts. In these forests sev-

eral species are to be found, and few are restricted to just one vegetation association. The specialized feeding method of the Shrike-tit (see Food and Feeding) means that it is found in open eucalypt forest, particularly that with decorticated bark; this is stringy bark that comes away from the trunk but remains attached to the tree in places, curling up where it dangles. The Golden Whistler and the Rufous Whistler overlap in range in many places, but they are separated by their broad preferences for wetter and drier forests, respectively. In arid and semi-arid zones, the Crested Bellbird and Gilbert's Whistler can be found in several types of eucalypt-dominated woodland and scrub, and sometimes in those in which acacias (*Acacia*) or other trees feature more prominently. The Red-lored Whistler is a specialist on certain types of mallee, a rather low, multi-stemmed eucalypt type, particularly those with associations of broombush (*Melaleuca*) and porcupine grass (*Triodia*), the latter known also as "spinifex".

In contrast to the rainforest species of New Guinea and other tropical islands, Australian species may be much more flexible in their habitat choices. The Grey Whistler, lives in a variety of habitats in northern Australia and New Guinea, ranging from rainforest to adjacent open woodland, mangroves and secondary growth. For diversity of habitat preferences, the Grey Shrike-thrush is unmatched in this family. In some areas it can be found in rainforest, while elsewhere it enters wet and dry eucalypt forest and woodlands, well into the arid zone. It can be found also in coastal vegetation, dry acacia woodland, and human-altered areas such as homesteads, gardens and exotic pine (*Pinus*) plantations. In New Guinea, the Grey Shrike-thrush inhabits savanna woodland and coconut and rubber plantations, as well as mangroves.

Some species are found in mangroves on a much less opportunistic basis. The White-breasted Whistler for example, is restricted to mangroves of northern and north-western coastal Australia. On the other hand, and despite its English name, the Mangrove Whistler is not confined to this habitat; across its wide range, it can be found also in several other types of coastal vegetation. The Black-tailed Whistler more or less occupies mangroves only in its mainland populations, although it occasionally enters other closed habitats. On islands, however, it moves into more open wooded habitats, too. Throughout its range in New Guinea and north and west Australia, the Little Shrike-thrush is primarily a bird of rainforest and adjacent wet vegetation, less





Most pachycephalids are rather sedate foragers. The members of *Pachycephala*, for example, often perch quietly on a horizontal branch while peering intently at the underside of nearby leaves, looking for signs of insect life. Most feed primarily by gleaning, and this Bornean Whistler is no exception. This denizen of montane forests on Borneo also sally-strikes, making short, aerial forays to snatch an insect off the bark or leaf surface. This bird has just caught a moth and is mandibulating it, moving it into a position where it can easily be swallowed.

[*Pachycephala hypoxantha hypoxantha*, Mount Kinabalu National Park, Sabah, Borneo. Photos: Leif Gabrielsen]

often venturing into other neighbouring habitats. The populations in northern and north-western coastal regions of Australia, however, are largely limited to mangroves.

The sandstone escarpments of northern Australia, from Arnhem Land and its outliers westwards to the Kimberley region, are home to the Sandstone Shrike-thrush. This species is closely associated with this escarpment country, with its sandstone cliffs and gorges. It may occasionally enter the monsoon rainforest found in escarpment gulleys, but it prefers areas with a ground cover of low shrubs, scattered trees and porcupine grass. It feeds and nests among the sandstone ledges.

The wide distribution of the genus *Pachycephala* incorporates many island groups. Some species, most notably the Golden Whistler, have extensive ranges through several groups of islands. In contrast, there are others restricted to particular island groups, such as the Bare-throated Whistler, confined to Sumbawa and Flores, and the Fawn-breasted Whistler, on Timor, Semau, Wetar and Jako, both to the west of New Guinea; and to the east, the Samoan and Tongan Whistlers. The few non-whistlers found on only small islands are the Morningbird, on Palau, and the Sangihe Shrike-thrush, confined to the north Moluccan island of that name.

Two species occur in several island groups but appear to specialize on small islands. The Island Whistler is found from the Moluccas eastwards to western New Guinea, but in this area it is absent from the largest islands, occurring only on the smaller satellite ones and, more rarely, on the coasts of a few more moderately sized islands. Away from its mainland range in north Australia and south-eastern New Guinea, the Black-tailed Whistler is restricted to small islands between eastern New Guinea and the Bismarck Archipelago and the northern Solomon Islands.

Having the broadest range of any member of this family, the Golden Whistler can be found in a wide variety of habitats. In Australia, its habitat selection is perhaps more varied than that of any other species except the Grey Shrike-thrush, being found both in coastal rainforests and in riparian thickets in semi-arid country. In the islands, it is a bird of wetter forests, but in which other habitats it can be found depends to some degree on with which other whistlers it co-exists, as well as on the local topography. Where it is the only whistler present, or if others are present but they differ from it in size, the Golden Whistler may extend its occupancy to other habitats, including secondary growth, bamboo thickets, and occasionally mangroves, plantations, gardens and more open country, its choices differing from island to island.

The White-bellied and Black-headed Whistlers, close relatives of the Rufous Whistler in New Guinea, share the latter's preferences for drier, open forest. This has allowed the Black-headed Whistler to colonize new areas in the highlands as native forest is cleared for plantations.

Australia, with its lower mountains, does not exhibit a pronounced degree of altitudinal zonation of its avifauna. In the northern part of its distribution, the Olive Whistler is found above 1000 m, most often in cool temperate rainforest. At the southern end, it ranges as high as 1800 m, in part, at least, because the mountains are higher than those in the north, but it also extends to the coast and is found in a greater variety of habitats. The only other Australian pachycephalid with a noticeable altitudinal restriction is Bower's Shrike-thrush. This species inhabits the Atherton Tableland and adjacent highland areas of north-eastern Queensland above 400 m.

Of those islands with mountains, several harbour whistlers with even more extreme restrictions to high elevations. In Sulawesi, the Maroon-backed Whistler lives at 1500–2200 m and the Yellow-flanked Whistler at 1200–3500 m, mainly above 2000 m. The Bornean Whistler occurs in the 900–2000 m zone, in places reaching 2600 m. On Bougainville and Guadalcanal, the Hooded Whistler overlaps with the closely related Golden Whistler at the lower end of its elevational range, but it then replaces that species at high altitudes, above 1500 m on Bougainville and above 1250 m on Guadalcanal, reaching at least 2000 m. These species contrast with the Sulphur-bellied Whistler of Sulawesi and the island species of the Philippines, which have much larger altitudinal ranges, occurring from the lowlands to well into the highlands.

Among the rainforest species of New Guinea there is well-marked altitudinal zonation, with several examples of apparent altitudinal replacement involving morphologically similar and/or taxonomically related species. Local conditions and avifaunal composition affect the upper and lower limits at which species are found, with occasional marked extensions of elevation in some areas. Detailed work on the habitat specifications for different species in New Guinea is sparse to date, and a listed habitat of "rainforest" is seldom broken down further to provide more specific data.

Some species occur in the lowlands, ranging to various elevations in the foothills and lower mountains. These are the Grey Whistler, occurring to 1400 m and locally to 1550 m, the Little

Australian whistlers forage in all strata, but the **Rufous Whistler** tends to feed higher than most. Mainly arboreal, this species normally feeds in subcanopy and canopy foliage. From here, birds sally or flycatch for aerial insects such as the one that this female has caught; indeed, this species is probably the most aerial of all pachycephalids. Rufous Whistler sexes frequently differ in foraging height and method. At some sites, females forage lower than males, while males tend to sally-strike more and glean less than females.

[*Pachycephala rufiventris rufiventris*, Wyperfeld National Park, Victoria, Australia. Photo: Peter Fuller]



Shrike-thrush, to 1850 m and locally to 2300 m, the Rusty Pitohui, to 800 m and locally to 1100 m, the Crested Pitohui, to 1300 m, and the Variable Pitohui, found at up to 1100 m but locally to 1500 m. Two lowland species are known to have very specific habitat requirements. There are few records of the White-bellied Pitohui, and all come from lowland forest on flat subcoastal plain, usually with a broken canopy and an open middle storey. The apparent prerequisite for this species' occurrence is high annual rainfall, exceeding 3750 mm, leading to seasonal inundation of the forest. Another lowland New Guinea species having more specialized requirements is the Golden-backed Whistler, which occurs only in vegetation along the edges of lakes and rivers, such as secondary growth, shrubs and tall canegrass, with occasional records from *Albizia* trees in tea plantations.

There is a suite of mid-montane species, including the Vogelkop Whistler, found at 970–1450 m, and the Rufous-naped Whistler, which lives at 1200–3600 m, but mainly at 1400–2600 m. Similarly, the Mottled Whistler is found mostly at 820–2550 m, mainly above 1500 m, but occasionally ascends to 2900 m. The Brown-backed Whistler is a highland species. From a lower elevational limit of 1830 m, and locally 1130 m, it extends upwards to the timber-line at 3350–3600 m. Here, it frequents forests and ecologically disturbed areas, occasionally moving out to small trees in alpine grassland.

Occupied zones can be narrow, as in the case of the Rusty Whistler, which is found above 400 m and below 1200 m. This species falls in an altitudinal gap between the zones used by the Grey Whistler and Sclater's Whistler, albeit with considerable overlap. In some areas, Sclater's Whistler can descend as low as 350 m or ascend as high as 2450 m, but most often it lives in a zone at 1000–2000 m. Locally, it can overlap considerably with the Regent Whistler, which occurs mainly between 1850 m and 3650 m but in places comes as low as 1300 m. Lorentz's Whistler co-exists with the Regent Whistler in some areas, but not in others. Where the latter species is not present, Lorentz's Whistler is found at 1750–3800 m. When the two species meet, they occur together in the lower section of this zone, but Lorentz's Whistler alone extends above 2700 m. Another series of apparent ecological replacements, again with considerable overlap, comprises the Variable Pitohui at low elevations, the Black Pitohui at higher elevations of 1000–2600 m, chiefly 1600–2000 m, and the Hooded Pitohui between these two at 350–1700 m, but occasionally to 2000 m and locally descending to sea-level.

### General Habits

A few members of this family are shy, but the majority are curious and tame, and readily respond to an observer's whistles and squeaks by approaching closely and answering with songs of their own. The Grey Shrike-thrush is noted for its tendency to become particularly tolerant of human presence at some sites. This confiding nature, however, is apparently exhibited only by eastern individuals, those in the west of the range reportedly being much shyer.

Members of this family are not especially gregarious. They are usually encountered singly or in pairs for much of the year, but in the period immediately following breeding they can be accompanied by recent offspring. During non-breeding periods, larger groups may be formed, such as loose assemblages of Golden Whistlers in winter. Mohouas, too, are more gregarious at this time. Concentrations of these species often comprise a high proportion of subadults.

Most, if not all, pachycephalids that have been studied are territorial. With some, such as the Yellowhead, this is mainly during the breeding season. The majority of the species, however, display at least some degree of territorial defence during the non-breeding season, as well. Territory sizes vary from less than a hectare to 4.2 ha, although the sizes have been ascertained for only a few species. The larger pitohuis may occupy larger areas. The territory of the White-breasted Whistler is more or less one-dimensional, being restricted to strips of coastal mangrove. Its length, from 50 m to several hundred metres, depends on its quality. During the non-breeding season, Rufous Whistlers use a foraging area which is larger than the area defended when breeding.

Little is known of the roosting habits of the members of this family. One of the better-studied species, the Rufous Whistler, appears to roost usually among foliage in or near the central part of its territory, or in some cases, perhaps involving mainly young fledglings, near the nest. The Grey Whistler has been reported as roosting in the open at night in north-east Queensland, but few details are provided, and the same lack of data attaches to the Grey Shrike-thrush, which has been reported as seemingly spending the night-time period in thickets of vegetation. There is an old record of the roosting behaviour of the Shrike-tit in Victoria, where, in May, an adult female and four young slept on a very small outer branch of a 5-m sapling; in the following month a single youngster roosted in the same place, where it perched in a hunched posture, with the crest held flat.





*Pachycephalids such as this Grey Whistler tend to forage alone or in pairs rather than with conspecifics. Many, however, join mixed-species flocks. Where pachycephalid species co-occur, they divide up food resources by feeding at different heights and in different parts of the tree. Where the Grey Whistler co-exists with the Rusty Whistler (*Pachycephala hyperythra*), it tends to favour the inner and middle parts of the tree, particularly in the middle storey.*

[*Pachycephala simplex simplex*, Darwin, Northern Territory, Australia.  
Photo: Peter Fuller]

Bathing has been documented for a few pachycephalids, and is probably widespread among the family. It is achieved generally by standing in shallow water, and splashing the water over the head and wings. The Grey Whistler, for example, during dry weather in New Guinea, has been observed to bathe by squatting in a shallow forest pool and fluttering its wings. In New Zealand, adult Whiteheads led their young to a creek, into which the birds jumped; they then proceeded to soak their feathers by splashing water over themselves, before moving to a nearby branch, where all members preened and dried out. Similar behaviour has been recorded for the Shrike-tit, which splashes about energetically in the water, holding its crest raised and the tail spread. An interesting account of the bathing behaviour of this species refers to an individual watched in Victoria that bathed in a secluded puddle on the bed of a stream, which the Shrike-tit reached by approaching cautiously over rocks; finally, having scanned from a slightly taller rock for any signs of potential danger, it hopped into the water, fluttered about for a brief moment, and then jumped back on to the rock, before repeating the process once more. In addition, both sexes of the Rufous Whistler have been seen to indulge in foliage-bathing, in which they flapped their wings and hopped about among the dew-laden leaves or made very short flights within the wet foliage. Similarly, a male Golden Whistler was recorded as flapping among wet leaves near the top of a tree for about twelve minutes.

Preening normally follows bathing. In studies of Rufous Whistlers in northern New South Wales, it was found that females spent more time in preening than did males. This species concentrated mainly on the head, breast and wings, made use of both feet when preening, and scratched the head indirectly, by bringing one foot up over the wing. Golden Whistlers indulged in casual head-scratching and preening of the wings in the non-breeding period. The Rufous Whistler has also been observed to perch in the outer foliage in a posture with the wings outstretched, apparently sun-bathing.

Finally, there are a few reports of anting by pachycephalids. A Grey Shrike-thrush was watched as it stood in an upright posture on the ground while picking up sugar ants of the species *Camponotus consobrinus*. For about 18 minutes, it repeatedly flicked its wings upwards, one after the other, each time thrusting its head beneath the wing and running the bill down its flanks. After the event, the observer found dead ants on the ground where the shrike-thrush had been. Another individual of this species was seen to swallow ants after having "wiped" the insects under its wings and beneath its ruffled tail feathers. In a further observation, a Grey Shrike-thrush was observed as it lay on the ground with its wings spread in an act of apparent passive anting, allow-

ing ants swarming from a crack in a path to crawl over it. The Rufous Whistler, too, is said to engage in active anting, although few details are available. A particularly interesting observation concerns the Little Shrike-thrush. In this instance, an individual picked up small millipedes (*Diplopoda*) and brushed them under one of its wings, before dropping them. It was seen to perform this action three times.

## Voice

Whistlers are well named. Together with other members of the family, they constitute some of Australasia's most outstanding songsters. Their voices are strong and distinctive, and the songs of most species are quite characteristic, differing in phrasing yet sufficiently similar in quality to be immediately recognizable as belonging to a member of this family. Singing is not always limited to males; females and the young of many whistlers are also very vocal. Bouts may routinely last for up to 15 minutes, and at top volume can be heard at a distance of 300 m or more. The height of singing activity is during breeding, and some individuals will even sing while sitting on the nest, but songs can be heard at any time of the year.

Many whistlers have songs comprising series of loud, clear whistles, usually varying in speed and volume, and often finishing with one or two loud whipcrack-like notes. These songs can be complex, owing to a varying number of component phrases, and the apparent enthusiastic manner in which they are performed endows them with a vivacious quality. Other whistler species have shorter, quieter, rather pensive-sounding songs. An interesting reaction is the sudden burst of singing habitually given by some whistlers after any loud or sudden noise, such as a clap of hands, a peal of thunder or a rifle shot. This practice earned the Rufous Whistler the early colloquial name of "thunderbird".

Shrike-thrushes, too, have variable songs, usually shorter than those of whistlers, but the quality is even more rich, mellow and beautiful, and the songs are often louder. The notes can be flute-like. One or two notes are often louder than the rest, and the song concludes with a drawn-out note or high clear whistle. The Grey Shrike-thrush was given an earlier name, that of "Harmonious Thrush", because of its singing ability. Some transliterations of its song are "purr-purr-purr-que-yule", "pip-pip-pip-ho-ee" and "too-too-too-weet".

Vocalizations of pitohuis, although less well studied, are likewise loud and melodious or staccato whistles. Many of the elements are upslurs or downslurs, or both, with a mix of scratchy notes. The song of the Variable Pitohui has been written as "tow-

hu, towhíhu-uwuwu, tow-whíew, towhuwéú, towwhééí, tu-wu". That of the Crested Pitohui starts with a slow series of ringing notes, these dropping in pitch while increasing in speed from several to many notes per second. Each note may be preceded by a short soft "tsk". The notes are repeated many times without interruption, often for 2–3 minutes, but sometimes for up to 15 minutes. This creates a throbbing, monotonous sound likened to that produced by blowing across the mouth of a large open vessel, and it has been described as one of the most unusual avian vocalizations in New Guinea.

The loud, musical song of the Goldenface has a whistler-like quality, which has been cited as a possible indication of their interrelationships. That of the Shrike-tit lacks the volume of the whistlers' songs. It is a mournful, mellow, high-pitched whistle, "keep-keep-keep...", descending and drawn out. The three mohouas, namely the Whitehead, Yellowhead and New Zealand Brown Creeper, have trills, whistles and warbles reminiscent of those of a canary (*Serinus*). The sexes of the New Zealand Brown Creeper have separate songs, that of the male consisting of loud whistles and harsh notes, while the female sings with rapid, brief notes.

The song of the Crested Bellbird is one of the more remarkable avian vocalizations in Australia. As the English name suggests, this has a ringing quality that has been likened to the sound of a cowbell or that made by a stone being dropped into a pool. It begins softly, and then grows in volume. The opening notes are monotone, and the final three add the bell-like aspects. Transliterations of this have included "pan pan panella", "dick-dick-the devil" and "did did did didee-dit". Because of the pronounced ventriloquial nature of the song, it can be difficult to locate a singing Crested Bellbird. This results from the bird's changing the direction in which it is facing when singing while simultaneously altering the volume.

Marked geographical variation has been noted in the vocalizations of some species. Within Australia, the Grey Shrike-thrush exhibits considerable regional differences. Furthermore, individuals have considerable repertoires of song phrases, males usually about 16 and females about eleven. A bird can combine these in various ways, producing an ever-changing array of vocalizations. The Golden Whistler is another such practitioner. It has many regional dialects through the islands in its range, but most are easily recognizable as belonging to this species because of the characteristic patterns. Within its comparatively small dis-

tribution, the Olive Whistler shows considerable vocal differences between isolated populations, with evidence of dialects among inhabitants of contiguous ranges. These dialects are most evident in the starting and concluding notes; intervening phrases are largely shared by all populations of this whistler. Another species noted for local song variation is the Black Pitohui.

Singing contests, or countersinging, between owners of adjacent territories are vigorous, particularly during the breeding period. During such disputes, neighbouring Golden Whistlers alter their songs so that they agree in tempo and frequency, a process referred to as "song-matching". Similar behaviour, sometimes involving three rival males, has been recorded among New Zealand Brown Creepers.

For several pachycephalid species, mates or members of the same family group have been recorded as duetting. In the case of the Variable Pitohui, songs may be the same for each sex. One member of a pair starts singing and is quickly joined by the other. In another form of duetting, one individual utters a whistled upslur, to which the second answers with a staccato "tup". When two Rufous Whistlers are engaged in conversational song, they alternate the same phrases but run these together so closely that it is difficult to determine which one is vocalizing at any particular time. During duets by the New Zealand Brown Creeper, each sex uses its own song. A more complex duet is given by the White-bellied Pitohui, whereby the first individual gives a medium-pitched phrase, and the second one, using a higher-pitched song, starts almost immediately after the first has begun. The initial singer repeats its phrase two to four times, finishing after its partner.

### Food and Feeding

The primary foods of these birds are invertebrates, mainly insects, but including also spiders (Araneae) and occasionally worms (Oligochaeta) and millipedes. Some of the larger-bodied species also include snails (Gastropoda) and small crabs (Decapoda) in the diet. The White-breasted Whistler eats crabs up to 20 mm in size. The shrike-thrushes are known to kill and eat small vertebrates such as frogs, lizards, baby birds and small mammals, including pygmy possums (Burramyidae). No doubt the pitohuis do the same, although this has not yet been recorded. Larger food items are bashed against the substrate, or held under the foot or wedged into a cleft while they are dismembered. Small

Most pachycephalids specialize in catching invertebrates, particularly insects, spiders, snails and even small crabs.

The shrike-thrushes have a broader diet, eating all this and more. In addition to consuming seeds and fruit, they are known to kill and eat small vertebrates, such as baby birds, lizards, and small mammals up to the size of pygmy possums (Burramyidae). This **Little Shrike-thrush** has caught a frog during a bout of terrestrial foraging.

The bird may bash the frog against a branch or the ground, or hold it in its foot while dismembering it.

[*Colluricincla megarrhyncha*, Queensland, Australia. Photo: Greg & Yvonne Dean]







The mohouas are unusual in the family in that they frequently forage in single-species flocks, particularly outside the breeding season. The Whitehead can often be found in groups of up to 10, and indeed flocks of 70 birds have been recorded. The mohouas also join and often lead mixed-species flocks. The Whitehead feeds at all levels of the forest, but favours the canopy, particularly in introduced pine plantations. Spending almost all its time in foliage or on branches, the Whitehead gleans or removes bark flakes with its bill, hanging upside down to search for insects and spiders.

[*Mohoua albigilla*, Tiritiri Matangi Island, off North Island, New Zealand. Photo: Clifford & Dawn Frith]

snails may be bashed against or dropped on to a hard surface. The Yellowhead has been observed to hold a prey item in the foot and raise it to the open bill. Many pachycephalids have been seen to eat fruit, and this comprises a not insubstantial proportion of the diet of some of them. Two species, the Yellow-flanked Whistler and the Mottled Whistler, are predominantly frugivorous. A few species are known to take seeds on occasion, and the Yellowhead has been observed to take nectar.

Most members of the family are rather sedate feeders, searching among foliage and limbs or foraging in a thrush-like manner on the ground. Whistlers, in particular, have a characteristic habit of perching quietly on a horizontal twig while peering intently at the undersides of the leaves above. By far the most common feeding technique used by these species is that of gleaning. In various studies, this has been recorded as comprising more than 95% of attacks on prey made by Bower's Shrike-thrush and up to 100% of those made by some New Guinea populations of the Little Shrike-thrush. Favoured feeding substrates may be foliage, as for the Goldenface, or twigs and branches. Another important foraging technique is that of sally-striking, in which the bird makes a flight, usually a short one, to pick a prey item off the surface of a leaf or bark. The Rufous Whistler may employ this method for up to 72% of the time in some localities and slightly more than 20% in others. Aerial capture of flying insects by sallying or flycatching is much less frequent, but is practised to a small extent by a number of pachycephalids. The Rufous Whistler is perhaps the most aerial member of this family. As well as its extensive use of sally-striking from surfaces, it will sally for flying insects, a method that can account for up to 16% of its foraging attempts.

A few of the longer-billed species probe extensively for food. The Grey Shrike-thrush has been recorded as probing for up to 18% of the time in mainland Australia and as much as 58% in Tasmania. This manoeuvre is not exclusive to these larger birds, as the New Zealand Brown Creeper, too, pokes its bill into cracks in the bark. Incidentally, it is the latter species' practice of moving along the bark in search of food, hanging upside-down and even climbing along the underside of branches that earned it its long-standing name of "creeper". The Grey Shrike-thrush and the Shrike-tit occasionally flush insects by using small sticks, which they poke into crevices.

That flycatching is a little-used foraging technique of this family is reflected in the lack of well-developed rictal bristles in

most of its members. The two species that do have prominent bristles, the Maroon-backed Whistler and the Black Pitohui, have not been studied in sufficient detail, so that any relationship between bristle development and their feeding techniques remains unexplored.

The laterally compressed bill of the Shrike-tit is specialized for the stripping of bark from branches, the bird often slipping its bill under bark and twisting its head in order to lever this bark off. The similarly shaped but smaller bill of the Wattled Ploughbill is employed in a similar fashion, this species removing bark by chipping it off or stripping it away. The ploughbill also digs into moss, and it carries out a considerable amount of gleaning from surfaces of bark and vegetation. In eastern Australia, there is a high frequency of decortivating bark. Shrike-tits are not the only birds to search this bark for food, but, unlike the others, they can extract invertebrates from places that other species cannot reach. The specialized bill allows them to probe into cracks and to pull and prise off curled sections of bark. In various studies in east Australia, it was found that food was obtained from bark in about 60% to almost 100% of foraging attacks, compared with less than 40%, and even as little as 4%, taken from leaves. The major manoeuvres used are probing and prising from bark, which account for 66–90% of foraging, whereas a third or less of the time is spent in gleaning from leaves. In eucalypt forests of south-western Australia, on the other hand, there is a much lower incidence of decortivating bark, and this is reflected in the feeding behaviour of Shrike-tits in that region. Without the same level of bark on which to feed, the birds are more reliant on foliage as a foraging substrate. Thus, only about a quarter of food is taken from bark, compared with 67–75% from leaves. Gleaning and hang-gleaning are far more important in the south-west than they are in the east, accounting for about 50% and 25%, respectively, of foraging time, whereas probing/prising makes up only 13–25%. Although it has not been examined closely, the situation in northern Australia appears to be more similar to that of the south-west than to that in the east.

Species show distinct preferences for certain sections of the vegetation strata in which they feed. Many forage at all heights, although favouring certain levels. A few are primarily terrestrial feeders, sometimes moving into the lower vegetation, but only infrequently venturing much higher in the vegetation column. Notable among these are the Red-lored and White-breasted Whistlers,

Shrike-thrushes forage in a variety of strata, but most species have a preference for searching for prey on or near the ground. The various studies of the feeding regime of the **Little Shrike-thrush** have produced different results, but the species mainly plumps for the ground, understorey or shrub layer of the forest. It primarily forages among foliage or on branches or trunks, but also seeks out accumulations of debris, vine tangles and palm fronds. The species catches almost all its prey by gleaning; when on the ground, it uses its bill, rather than its feet, to feed among leaf litter.

[*Colluricincla megarrhyncha*,  
Julatten,  
Queensland, Australia.  
Photo: Hans & Judy Beste/  
Lochman Transparencies]



the Sandstone Shrike-thrush, the Crested Bellbird and the Crested Pitohui. Most pachycephalids, however, although they will descend to the ground on rare occasions, are extensively, if not almost exclusively, arboreal. Some, such as the Rufous-naped and Olive Whistlers and Bower's Shrike-thrush, are birds of the understorey and lower strata. The majority, however, frequent the level from the subcanopy to the canopy. The Rufous Whistler usually feeds higher up than do other Australian species: 30–50% of its foraging effort can be above 10 m, and in taller forests about 10% may be higher than 15 m. Another species venturing into the higher canopy is the Whitehead. Interestingly, this species has been recorded at up to about 9 m in native vegetation, but in introduced pine plantations it spends nearly 20% of its time at levels of 15–25 m.

The pachycephalid with the broadest range of heights at which it regularly feeds is probably the Grey Shrike-thrush. This species spends a considerable proportion of its time in foraging on the ground, but in some areas it may spend as much or more time above 10 m, with significant amounts in the intervening sections. It may feed on the ground for 20–40% of its time when in more mesic forests with tall canopies 10–15 m or more in height, such as along the east coast or far north of Australia. In drier areas, with shorter, more open woodland, this proportion can rise to around 60%.

In New Guinea, Diamond looked at the suite of pachycephalid species found in the Eastern Highlands and investigated the way in which co-existing species subdivided the area in order to lessen competition. Recorded from this area are the Goldenface and a number of whistlers, shrike-thrushes and pitohuis, and these are split among different altitudinal ranges. Where several species are found together, they differ in their preferred feeding zones, as well as in their body weights. A community of pachycephalids includes species from several size categories, from large pitohuis through medium-sized and medium-small shrike-thrushes and whistlers, and often to the tiny Goldenface.

Just as there is separation by the height at which these species forage in the vegetation column, so, too, are there preferences for the particular sections of the trees in which they feed. J. Croxall studied this division in communities of insectivorous birds in New Guinea, in both the lowlands and the highlands. At each locality, in addition to many petroicid robins, monarch-flycatchers, fantails (*Rhipidura*) and thornbills, there are five species of co-existing pachycephalids. All obtain their prey almost exclu-

sively by gleaning, but they partition the habitat by feeding at different heights and in different sections of the tree. At the lowland site, the Little Shrike-thrush forages primarily in the undergrowth and the lower forest storey, from the trunk and large branches in the inner third of the tree, through the smaller branches of the middle, to the foliage of the outer third. The Rusty Whistler spends more time in the lower storey, most of it in the inner two-thirds. Similarly, the Grey Whistler concentrates on the inner and middle parts of the tree, overlapping with the previous species in the lower storey while extending much more into the middle storey. Sclater's Whistler is a bird of the middle storey and canopy, mostly in the inner third, less so in the middle. The fifth pachycephalid, the Goldenface, forages mainly in the outer foliage of the canopy.

Croxall's upland site also had five pachycephalid species, some of which were the same as those in the lowlands. The Little Shrike-thrush and Sclater's Whistler were found to have similar foraging profiles to those of their lowland populations. The Regent Whistler resembles the latter species, but resides somewhat more in the middle level, on the smaller branches of the central third of the tree. The Rufous-naped Whistler is a bird largely of the undergrowth, with some time spent in the lower storey and on the ground; it foraged almost exclusively on the trunk and large branches of the inner third. Finally, the Brown-backed Whistler is found in the canopy, rather evenly from the inner branches to the outer foliage.

Shifts in foraging heights and zones with changes in altitude are exhibited by the Regent Whistler. In the lower part of its range, it spends 60% of its time in the lower storey and 40% in the middle storey, whereas, in the upper montane section, it forages for about 15% of the time in the canopy and 80% in the middle storey and spends only about 5% of its time in the lower storey. Concomitant with these changes are shifts in the part of the tree in which this whistler feeds. As the elevation increases, its preferred foraging zone moves from the inner two-thirds of the tree, where it forages mainly on large and small branches, to the middle and outer third of the tree, where it spends more time in the branches and outer foliage.

Differences between the sexes in foraging heights, preferred section of the vegetation or capture methods used have been noted for several species. This separation appears not to occur at all sites, as no obvious sexual differences were recorded at some



locations. Male and female Rufous Whistlers frequently differ in the heights and sites at which they forage and in the methods used. When they do express such divisions, it is the female that forages lower, often near the ground. Separation between the sexes in substrate preference has been recorded for the Shrike-tit. The male of this species spends slightly less than two-thirds of its foraging time on dead branches and large coiled ribbons of bark, whereas the female devotes about an equal time to foraging on leaves, petioles and galls.

At some study sites, male and female Golden Whistlers have been recorded as feeding at different heights, as in central eastern New South Wales, where males were observed above 5 m for 90% of the time and females below this height for 77% of the time. At other Australian localities, no obvious differences are evident. A similar situation occurs in neighbouring islands in the Solomons, where females on San Cristobal often accompany males into the lower canopy, whereas, on Guadalcanal, the females remain in the undergrowth, a few metres or less from the ground. The opposite pattern has been noted in Fiji: here, females and young remain in the canopy, and only the adult males move into the lower vegetation layers.

This species is flexible in other aspects of its foraging, the amount of time spent at different strata and the methods employed varying from one site to another. In a study in Australian rainforest, Golden Whistlers were found mostly above 5 m, from the subcanopy to the upper canopy, foraged chiefly in the foliage and on twigs and small branches, and captured most of their prey by gleaning; the proportion for each parameter was about 80%. In wet eucalypt forest of eastern Australia, in contrast, they were observed 65% of the time below 4 m, 67% of their foraging was in the foliage and 13% in branches, and they were more aerial, 10% of attacks on prey being in the air; in addition, sally-striking off vegetation accounted for 70% of prey captures, whereas gleaning made up only 15%. Golden Whistlers in the low, open dry eucalypt woodland of south-western Australia spent up to 20% of their time in foraging on the ground, 34% above 5 m, and the rest of the time in the strata between. Gleaning and sally-striking on vegetation were the most important techniques, accounting for 56% and 40%, respectively, of observed captures. On several of the islands in its distribution, the Golden Whistler has been described as obtaining its food by gleaning. An exception is Fiji,

where the birds have been recorded as sallying more than three times as much as gleaning.

Seasonal shifts in foraging substrate have been recorded in regions where the winter conditions are more severe. During the summer in Tasmania, foliage and branches are commonly used substrates, exploited for, respectively, 43% and 30% of the time, and there is a substantial reliance on aerial feeding, which makes up 24% of attempted prey captures. In the winter months, when flying insects are absent, only 6% of captures are made in the air, and over 80% of foraging attempts are in the foliage, with the remainder on branches.

Members of this family are usually not overly gregarious with conspecifics when foraging, feeding singly or, less often, in pairs. Mated partners are more likely to feed separately, albeit usually within hearing distance of each other. One species that does not follow this generality is the Shrike-tit, groups of three to five individuals of which regularly forage together, particularly in the non-breeding season. The three New Zealand *Mohoua* species are also exceptions. They frequently form small monospecific flocks of 3–12 individuals, but on occasion they gather in groups of up to 40 and, in the case of the Whitehead, rarely to 70.

Much more common is participation in mixed-species foraging flocks. This has been recorded for several whistlers, shrike-thrushes and pitohuis, as well as the Wattled Ploughbill, the Goldenface, the Whitehead, the Yellowhead and the New Zealand Brown Creeper. The last three species regularly form the nucleus of such flocks. They are usually the most abundant species, and forage at the front of the flock, determining its direction. Pitohuis are major components of mixed flocks in New Guinea, often serving as leaders. Five of the six species have been observed at the head of flocks. Many of the other species found accompanying the pitohuis have plumage that is black, brown or a combination of these colours.

The heights at which the Rusty Pitohui forages when it is a member of these flocks differ from those used when it is feeding by itself. Alone, it forages in the main canopy for about 60% of the time and splits the remainder evenly between the subcanopy and the understorey. The presence in the foraging flock of the New Guinea Babbler (*Pomatostomus isidorei*), a bird of roughly similar colour and size, also influences the way in which the pitohui divides its foraging time. Without the bab-



Little is known about the breeding habits of most of the Pachycephalidae, and information on even the commoner Australian species is often sparse. Against this backdrop, the Little Shrike-thrush has been relatively well studied. In New Guinea, the species appears to have two breeding periods, one in the late dry season and early wet season, the other in the late wet season and early dry season. In Australia, the Little Shrike-thrush is multi-brooded and has been known to make five breeding attempts in a single season. The female and probably the male incubate two or three eggs for 17–19 days.

[*Colluricincla megarhyncha*, Paluma, NE Queensland, Australia. Photo: Clifford & Dawn Frith]

Unlike many Australasian passerines, almost all pachycephalids breed as simple, monogamous pairs, without recourse to helpers.

The **Rufous-naped Whistler** fits the mould, and in this photograph what we are probably seeing is the male feeding a small black fruit to his incubating partner. Pairs share the reproductive tasks, both helping to construct the nest, incubate, and brood and feed the nestlings.

The Rufous-naped Whistler breeds during the late dry season to early wet season, and from the middle of the wet season to early dry season. The female usually lays two eggs, occasionally just one.

[*Alcedryas rufinucha niveifrons*,  
Tari Gap,  
Papua New Guinea.  
Photo: Clifford & Dawn Frith]



bler in the flock, the pitohui spends far more of its time, about 80%, in the canopy and only some 10% in each of the subcanopy and the understorey. When the New Guinea Babbler is present, however, the Rusty Pitohui spends only half of its time in the canopy and 30% in the subcanopy, its duration in the understorey making up the remainder.

The only pachycephalid species that has extensively exploited an association with humans for food is the Grey Shrike-thrush. In some places, and where it is not molested, it readily learns to approach humans for the handouts offered by them.

## Breeding

Little or nothing is known about the breeding of many species in this family, and there are substantial gaps in information on even several of the relatively common Australian species. That which does exist is often largely anecdotal in nature. Only a few species have been studied in detail. As a result of such studies, the best-understood members of the family in terms of their reproductive behaviour and biology are the three New Zealand species, along with the Golden and Rufous Whistlers and the Grey Shrike-thrush. In addition, substantial amounts of data have been gathered on the Shrike-tit, the Crested Bellbird, and the Little and Bower's Shrike-thrushes.

In Australia, breeding may start in the winter months of July and August or in early spring, and continue until February–March. Local variations occur in relation to the availability of rainwater or other resources. This can lead to regional differences in timing across a species' range. For example, northern and western populations of the Grey Shrike-thrush start breeding earlier than do those in the east or south. The flexible Grey Whistler is thought to breed in any month of the year in north-eastern Australia. New Zealand species have comparable seasons to those in Australia, although typically they do not commence breeding until September.

Breeding records from New Guinea are scattered and few. There is sufficient information about the Hooded and Rusty Pitohuis to give an indication that these begin breeding in the late dry season and continue into the middle of the wet season, at least. This pattern is likely to hold for many other New Guinean species. The Grey Shrike-thrush in New Guinea has two breed-

ing peaks, one in the late dry season and the other in the middle to late part of the wet season. Even less is known about breeding seasons of most island populations. The Golden Whistler on western Flores nests from March to April, two-thirds of attempts being made in April–May, at the end of the wet season. Whether this timing holds in other Wallacean islands is uncertain. The bulk of avian breeding on Timor is earlier than this, during the wet season, but records for whistlers are scarce. In India and south-eastern Asia, the Mangrove Whistler starts in the northern spring,

The timing and availability of rainfall can lead to regional differences in the timing of a pachycephalid's breeding season across its range. In Australia, northern and western populations of the **Grey Shrike-thrush**, for example, breed earlier than those in the south and east. In New Guinea, this species has two breeding peaks, one in the late dry season and the other in the latter part of the wet season. This bird has built its nest in a natural cavity that should offer some protection against predators. Should an intruder venture close to the nest, the adult shrike-thrush may feign injury in an attempt to distract it.

[*Colluricincla harmonica harmonica*,  
New South Wales,  
Australia.  
Photo: ANT/NHPA]







The nest of the **Golden Whistler** is fairly typical for a pachycephalid: an open cup is constructed from twigs, plant stems, grass, rootlets and bark, and lined with grass and rootlets. Typical clutch size is two or three. Both partners incubate, and the chicks hatch after 15–16 days. In Australia, between half and three-quarters of all eggs hatch, so the members of this pair have done better than most. Both sexes then brood and feed the chicks for 10–12 days, and continue to feed the fledglings after they leave the nest. In some localities, Golden Whistlers maintain pair-bonds in successive years, despite partners spending the non-breeding season apart.

[*Pachycephala pectoralis youngi*, Victoria, Australia. Photo: ANT/NHPA]

in March–April, and continues to July, at least, although this varies from year to year.

Pachycephalids are monogamous, breeding as simple pairs. Helpers at the nest have been reported for a few species, the role of these auxiliaries being largely restricted to assisting with the feeding of the young. Single helpers have been observed at nests of Shrike-tits, while another species with auxiliaries, the White-head, can have as many as six helpers on occasion, with much the same role of helping to provision nestlings and fledglings. Their presence allows the female to construct a new nest for a second clutch. As she builds, the auxiliaries assist the male with the first brood. These helpers are themselves capable of breeding, but, because of social constraints in some areas resulting from high population density, the opportunity to do so may not arise for two or three years. By assisting their parents, they gain experience and remain well placed for any vacancies that arise. The presence of auxiliaries at pitohui nests is known from a few opportunistic observations. At nests of Rusty and Hooded Pitohuis, the young have been seen to be fed by more than two individuals. When the observers approached the nest of the Hooded Pitohui too closely, four or five birds appeared in defence of it.

Where marked individuals have been subject to longer-term observation, a high level of mate-fidelity has been found. Rufous Whistlers exhibit this throughout the year and from one year to the next, and it has been observed even among migratory populations. Maintenance of pair-bonds in successive years has also been recorded for some Golden Whistlers, despite separation of the partners in the non-breeding season. At other localities, there is little evidence of this.

Double-brooding is routine for a number of pachycephalids. The White-breasted and Olive Whistlers are apparently single-brooded, whereas the Rufous Whistler may rear three broods in a season. New clutches may be started 7–16 days after the young fledge. At one nest in New Guinea, a pair of Grey Shrike-thrushes was observed to raise two sets of young during the late dry season and then, after six months, to be rearing a third in the late wet season. In the event of clutch loss, most species lay replacement clutches. Several members of the family are reported as making up to four or five attempts in a season.

Migratory individuals of the Rufous Whistler show a strong degree of philopatry, returning in successive years to the same territory or a neighbouring one. Males arrive first, 3–3.5 days before the females, and immediately start to re-establish territories. As other members of this family, this species advertises its territorial ownership with bouts of loud singing. Rivals are confronted with bowing displays. This peculiar behaviour of whistlers involves rocking forwards and backwards while perched, and the same seesaw action may also be performed when the bird is watching a person or displaying to a mate. As with many species, both sexes will actively defend the nest and young, often driving away larger intruders, as well as innocuous species that venture too close.

Territorial defence by the New Zealand Brown Creeper involves unison singing. If a sitting female detects an intruder, she calls the male, and the two engage with their rival in a display consisting of making approaches and retreats while singing. Occasionally, display alone will not resolve a dispute and physical conflict takes place, sometimes leading to fighting on the ground. Males engage only with males, and females only with females.

When faced with bigger threats, several responses may be given. Yellowheads, for example, are known to mob predators. Most pachycephalids, however, are less social and do not have a pool of conspecifics on which to rely for defence. Adult Grey Shrike-thrushes may feign an injury or otherwise appear vulnerable, with fluffed feathers and quivering wings, in order to lead an intruder away. Comparable reactions are given by Bower's Shrike-thrush. A display by adult Gilbert's Whistlers towards an observer near the nest consisted of the birds spreading the wings and tail while moving quickly among the branches. Similar behaviour has been reported for the Red-lored Whistler. Surprisingly, Golden and Rufous Whistlers, despite being much better-studied species, have not been observed to perform distraction displays.

Courtship displays, although not described in detail, involve the female quivering her outstretched wings, while the male, perched nearby, rocks back and forth with the wings and tail held partially spread and trembling or moves from one side of the female to the other. This can be followed by a pursuit-flight, feeding or copulation. Two male Whiteneads may approach a female,

The **Crested Bellbird** builds its nest a metre or two above ground in the fork of a tree trunk, or in a hollow stump or trunk.

The nest is a deep cup of twigs, bark and leaves, lined with shredded bark, fine grass and rootlets.

The Crested Bellbird usually lays two or three eggs. On average, two-thirds of these hatch and a third produce a fledged chick. As is normal among pachycephalids, both sexes incubate, brood and feed the young. Peculiarly, and perhaps uniquely, the Crested Bellbird also often lines the rim of its nest with hairy caterpillars, or places them amongst the eggs. The bellbird paralyses the caterpillars by pinching them along their length, but does not kill them. The purpose of this practice is disputed.

Some think the bellbird is creating an easily accessible larder of food for the incubating adults to raid or to feed to the hatchlings. Others suggest that caterpillars may help repel predators, noting that the hairs of the tent caterpillar *Ochrogaster*, which is frequently used, irritate the human skin.

Evidence for the anti-predator theory comes from observations of nestlings, which appear to mimic the movements of hairy caterpillars.

[*Oreoica gutturalis*  
*gutturalis*,  
Manmanning,  
Western Australia.

Photo: Graeme Chapman]







Both sexes of the **Little Shrike-thrush** construct the nest, which is a deep, untidy cup of twigs, bark strips, dead leaves, plant fibres and rootlets. It is bound with spider web, moss or stems, and lined with fine tendrils, rootlets, plant fibres and other soft material. The adults usually site their nest within a couple of metres of the ground, in a thin upright fork among foliage, in a vine tangle, among palm fronds, or in a fern. The nest is frequently exposed to the elements. Around two-thirds of eggs hatch. Once they do, the chicks are fed by both parents. Each adult makes two or three feeding visits to the nest per hour. Pachycephalid nestlings apparently hatch naked, their eyes opening and wing-feather pins emerging after 5–7 days. After 10–12 days, in the case of the Little Shrike-thrush, the nestlings are fully feathered and leave the nest. The fledglings continue to be cared for by their parents. In some pachycephalids, parents split the brood between them, each caring for one or more young. Those that survive to adulthood may have a relatively long life ahead; the oldest known Little Shrike-thrush was over 16 years old.

[*Colluricincla megarrhyncha rufogaster*, Goomboorian, near Gympie, SE Queensland, Australia. Photo: Cyril Webster]

**Gilbert's Whistler** of Australia usually breeds from August to November, exceptionally from late July to late December. Pairs hold breeding territories all year; these comprise patches of dense understorey shrubs associated with mallee or woodland. The birds place their nest a couple of metres above ground in a fork among the foliage of a tree or shrub. The nest is a deep cup, made of dry grass, fine twigs and bark strips. Sometimes pairs use an old babbler (*Pomatostomus*) nest. Both sexes incubate the two or three eggs for about 15 days. A third of eggs hatch – fewer than other pachycephalids for which data are available.

[*Pachycephala inornata*,  
Comet Vale,  
Western Australia,  
Australia.

Photo: Bert & Babs Wells/  
Oxford Scientific Films]



showing off the spread wings and tail as described. One places himself between the female and his rival, and the other male then moves to the other side. This is repeated until the female chooses one of her suitors as a mate.

Division of labour between the sexes is rather uniform in this family. The standard pattern is for both parents to share nest construction, incubation, brooding and feeding of the nestlings, and care of the fledglings, although the degree and timing of input of each sex are variable. Nest-building by the female alone is characteristic of the Shrike-tit, the New Zealand species and apparently the Rufous Whistler. Any auxiliaries that are present contribute to the feeding of the young.

With one exception, all members of the Pachycephalidae build cup-shaped nests. Most are rather coarsely constructed, from twigs, bark and grass, with little external ornamentation; the nest of the Shrike-tit has a copious coating of spider web. Finer material, such as plant fibre, grass, feathers or hair, is generally added as a lining, although it is omitted in some cases.

The usual site for most species is in a horizontal or upright fork, either on a branch or on the trunk, or among a tangle of several close branchlets, or concealed among the leaves. Considerable adaptability is displayed in response to local conditions, the birds utilizing whatever situations are available. The Red-tailed Whistler has been known to construct its nest in a tussock of spinifex, whereas the Sandstone Shrike-thrush, in contrast, routinely places its nest on a ledge on the side of a sandstone cliff. The most flexible in its choice of nest-sites must be the Grey Shrike-thrush. As well as using the conventional tree forks, tangles and tree hollows, this species has been recorded as placing its nest down a mine shaft and on the ground. It is also noted for its readiness to adopt a range of artificial sites, including flower pots on verandahs, cans and baskets in tool sheds, disused cars, support beams of houses, holes in walls and old letterboxes. The Grey Shrike-thrush freely reuses old nests of a range of other bird species, as well as that of the common ringtail possum (*Pseudocheirus peregrinus*).

The Yellowhead, which uses cavities on a regular basis, places its nest in such a way that the top rim is usually more or less level with the bottom edge of the entrance hole. This dependence on cavities means that it must be somewhat liberal in its choices;

although this species' nest is usually built about 15 m from the ground, it is occasionally at less than 2 m or more than 30 m. The availability of hollows can, of course, be a limiting factor in some forests.

Shrike-tits generally build their nests in the upper canopy, sometimes up to 30 m from the ground, much to the dismay of early egg-collectors, for whom this species' egg was a prized acquisition! The nest is characteristically placed in a vertical, often three-pronged fork. Shrike-tits have the unusual habit of clearing away adjacent foliage by pulling or biting the leaves and growing shoots above and just below the nest. They may also strip the bark from small twigs around the nest, within a radius of up to 50 cm and even, occasionally, 2 m. The purpose of this extensive "house-keeping" is unknown.

The Crested Bellbird has the peculiar practice of lining the rim of its nest with hairy caterpillars, or placing them with the eggs. This behaviour begins during incubation. The bellbird paralyses the caterpillars by pinching them along their length, using its beak for this purpose. Those that are not securely paralysed begin to crawl away, often to be recaptured and returned. There is no agreement on the function of this practice. Some early writers asserted that the caterpillars were put in the nest as food for the newly hatched young; others disagreed. It has been pointed out that, since the caterpillars are placed there several weeks before the chicks appear, many of them die and dry out, becoming unsuitable as food. Another suggestion is that they serve as food for the sitting adults. The hairs of the tent caterpillar (*Ochrogaster*), which is often used, are intensely irritating to the human skin. Perhaps their presence has some repellent quality towards potential nest predators. Certainly, the observation that Crested Bellbird nestlings appear to mimic the movement of hairy caterpillars may suggest some form of anti-predator behaviour.

Among the Pachycephalidae, the most anomalous nest is that of the Goldenface. Unlike the cup-nest of the other members, it is a globular structure with a side entrance. This is placed on the ground, in a small depression at the base of a small sapling or tree. Nests thus discovered have been on slopes and sited on the downward side of the small tree. The nest is composed of three parts. A platform of small dry sticks serves as the foundation; these sticks are up to 160 mm long and 4 mm in diameter, and are





overlaid with a second layer of smaller sticks. Placed on the platform but not fastened to it, the materials not being interwoven with the underlying twigs, is a ball of leaf strips, usually from bamboo and grasses. These leaves are fairly decayed and appear to have been selected as such. They are moderately tightly intertwined, even more so on the inside of the nest. The side entrance faces downwards and has a small vestibule. In the nests reported above, the entrance faced downslope. Finally, on top of this globe is a dense layer of dead and decomposing leaves that partially overhangs the entrance. Observers report that the general impression is of a pile of leaf litter and decayed vegetation, effectively camouflaging the nest at even short distances.

Clutches of pachycephalid eggs usually contain two or three eggs, although some species, such as the Crested Bellbird and the New Zealand Brown Creeper, often lay four eggs, and the clutch of the Rusty Pitohui has been recorded as being of one egg only. Eggs are usually laid on consecutive days, but the last one of a clutch is occasionally laid after an interval of 48 hours.

Within the family, there is considerable variation in egg colour, usually sufficient to make generic, and sometimes specific, identification of eggs possible. The ground colour is pale, ranging from white or bluish-white to buff for most species, but pinkish in the case of the New Zealand species and some pitohuis. Eggs of the co-occurring Rufous Whistler and Golden Whistler can be distinguished by the predominantly olive colour of the former and the paler cream or white of the latter. Eggs of all pachycephalid species are marked to varying degrees with darker colours, the markings ranging from small speckles to larger spots and blotches, often with underlying ones in different colours. These are often concentrated at the larger end. Few comparisons of geographical variation in egg size have been made. In the Grey Shrike-thrush, Tasmanian breeders have larger eggs than those of conspecifics on the mainland to the north.

For most species for which the information is available, the incubation period is 15–19 days, but it can be as few as 13 days on occasion or as long as 21 days. In the case of the Crested Bellbird, incubation starts before the clutch is complete, resulting in asynchronous hatching of the eggs. The hatchlings are naked, with the eyes closed. The newly hatched New Zealand Brown Creeper has been reported as already having down on the head, back and wings, but in most species this down does not begin to appear until 2–4 days after hatching. The eyes open by days 5–7. At the same time, the pins of the remiges start to appear, and these usually break out by about the ninth day. Nestlings may be fully feathered by the age of 10–12 days.

The nestling period is often of shorter duration than the incubation period, only 10–12 days for the Golden and Rufous Whistlers and the Little Shrike-thrush, but that of the Grey Shrike-thrush lasts for up to 18 days. The three New Zealand species have substantially longer fledging times than do most other pachycephalids, with periods of 20–22 days recorded for the New Zealand Brown Creeper and the Yellowhead. The young are often unable to fly when led away from the nest by the adults.

After fledging, the young are dependent on the adults and remain with their parents for varying periods. In the first few

The breeding habits of the **Shrike-tit** are unusual in several ways. While almost all members of the family breed as simple monogamous pairs, the Shrike-tit occasionally makes use of helpers. Unlike other pachycephalids, the female alone builds the nest, which is often cone-shaped rather than the cup typical of the family, and is extensively coated with spider web. The Shrike-tit tends to nest in the canopy, far higher than most pachycephalids. Fledglings receive parental care for at least three months, perhaps longer than in other species.

[*Falcunculus frontatus leucogaster*, near Narrogin, Dryandra Forest, S Western Australia, Australia.

Photo: Michael Morcombe/ NHPA]



To improve chances of their young fledging, pachycephalid parents take care with nest hygiene and concealment. Nestlings excrete their waste products inside faecal sacs, so the nest can be kept free of putrefying faecal matter. Adults, like this **Little Shrike-thrush**, carefully remove the sacs, disposing of them some distance away from the nest, to avoid drawing unwanted attention to the nest. Each chick may excrete one faecal sac per hour, creating considerable work for the adults.

[*Colluricincla megarrhyncha normani*, Julatten, Queensland, Australia.

Photo: Hans & Judy Beste/ Lochman Transparencies]

days they huddle together, before beginning to follow the adults. Sometimes the parents split the brood between them, each caring for part of the brood. With the Rufous Whistler, for example, the female looks after the older fledglings, while her mate is responsible for the remainder. Care of the young may last for an extended period, as is so with the Shrike-tit, the young of which receive parental attention for at least three months and possibly up to six months. In the case of the Whitehead, this period of post-fledging dependence can last for nine months, after which the offspring may remain as helpers for up to 31 months. The young of migratory pairs of Rufous Whistlers stay in their territory for as long as eight weeks before departure. In non-migratory populations, the offspring remain until the beginning of the subsequent breeding season.

Hatching and fledging success rates are quite variable. Studies have revealed hatching rates of 50–70% for the Golden and Rufous Whistlers, the Little Shrike-thrush, the Crested Bellbird and the New Zealand Brown Creeper. A wider variation of 30–70% has been reported for the Yellowhead, owing largely to the local densities of predators at the time of the studies. Even more fluctuating is the hatching success of the Grey Shrike-thrush, which has been recorded in various studies as being as low as 30% and as high as 92%. This species' fledging success shows a similar range, 20–90% of eggs laid producing fledglings. Generally, the fledging rates of these species, where known, are 35–50%, but up to 80% of Yellowhead nestlings successfully fledge.

Members of this family are frequent hosts of cuckoos. In New Zealand, the Long-tailed Koel (*Eudynamis taitensis*) takes advantage of all three species that occur there. At least four Australian cuckoos have been recorded as laying eggs in the nests of pachycephalids. Similar parasitism no doubt takes place in New Guinea, too, but there are few records from there relating to the nests of whistlers or their allies.

Nest predation can be a major cause of failure, contributing to the sometimes low success rates. In Australia, a range of native bird species has been recorded as taking the eggs or young of pachycephalids. The Grey Shrike-thrush is itself not an infrequent perpetrator of such acts. Predation in New Zealand is principally by feral animals, the introduced stoat (*Mustela erminea*) and black rat (*Rattus rattus*) being by far the worst offenders.

If a bird manages to survive through the fledgling and immature stages, it has a good chance of continuing its life, as mortal-

ity rates thereafter are significantly lower. As many passerines in Australasia, pachycephalids can be long-lived birds. Marked individuals of several species have been recaptured after 15 years, and there are confirmed records of the Golden Whistler exceeding 18 years in age.

## Movements

For most species in this family, there is little evidence of any regular seasonal movements being undertaken. The distributions of New Guinea species are rather strongly altitudinally stratified, and any shifts would occur within the respective elevational zones. Two notable exceptions are the Black-headed Whistler and the Grey Shrike-thrush. These inhabit open country, rather than rain-forest, and have shown an ability to move into new districts as the forest is cleared. Both are expanding their ranges by colonizing cultivated areas in the highlands.

Local movements within island groups may take place, but they remain poorly documented. Although island populations obviously originated from cross-water colonization, there is scant evidence of such occurrences on a routine basis. The possibility was suggested as an explanation for the presence of the Island Whistler on Seram. This species had not been recorded during previous fieldwork dating back to the nineteenth century, but individuals were observed there in 1996. This record could be evidence of a recent colonization. Conversely, earlier ornithologists may have simply overlooked this whistler.

Seasonal changes in population numbers have been studied in most detail in Australia and New Zealand, but, despite extensive observations, the nature and timing of these remain far from resolved. Altitudinal movements are known to be made by the three New Zealand species, with portions of the population moving from the mountains into valleys during the winter months. Similar shifts are undertaken in Australia by the Golden Whistler and the Grey Whistler in the ranges of, respectively, the east and the north-east. The majority of Australian species are regarded as being sedentary, making only local movements or post-breeding dispersal. The bulk of the last appear to be undertaken by juveniles.

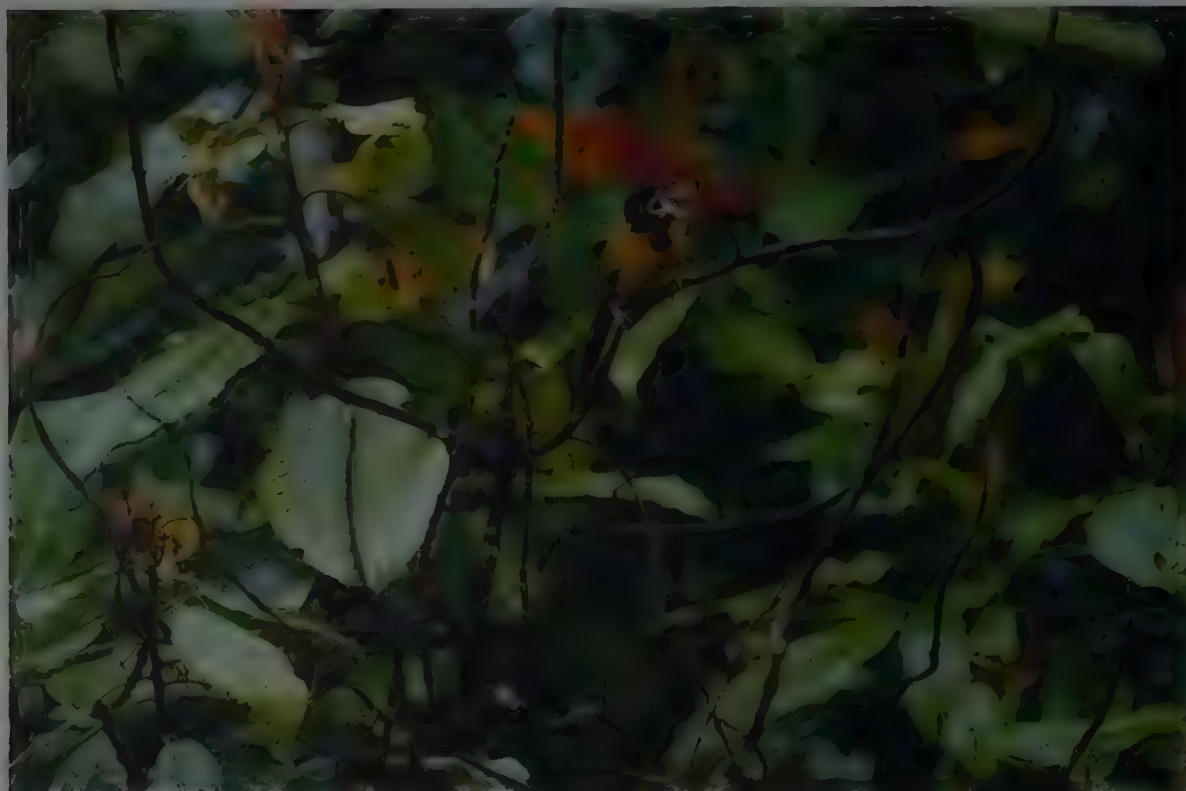
The situation is confused because of this difference among age groups, as well as between the sexes, and variation among populations in different parts of a species' distribution. These

Parental care does not stop once the young pachycephalids have fledged. Until the fledglings learn how to forage, the parents must continue to provision them, as demonstrated by these Bower's Shrike-thrushes. Fledglings are unable to fly for several days after leaving the nest, so the adults remain vigilant against predators. Should the youngster survive these early stages, its prospects are good. Adult mortality rates are low so, like many Australian passerines, pachycephalids can be long-lived. The oldest recorded Bower's Shrike-thrush was seven years old.

[*Colluricincla boweri*,  
Atherton Tablelands,  
N Queensland, Australia.  
Photo: Clifford & Dawn  
Frith]







The **Bare-throated Whistler** is a restricted-range species that occurs only in the Northern Nusa Tenggara Endemic Bird Area of Indonesia. While it remains locally common, and is thus not globally threatened for the moment, forest loss and degradation have restricted its habitat to less than 2000 km<sup>2</sup>.

The species is a remarkable songster, which has led to its being prized as a cage bird. Of all the birds trapped for this purpose on the island of Sumbawa, under a fifth survive to reach markets, and most of those die within a year.

This combined threat suggests that the species could perhaps justifiably be listed as Near-threatened.

[*Pachycephala nudigula nudigula*, Flores, Lesser Sunda, Indonesia.

Photo: Morten Strange]

confounding factors are illustrated in Australia by both the Rufous and the Golden Whistlers. The most markedly migratory is the Rufous Whistler. Along the east coast, at least a portion of breeding birds depart northwards in August or September, although the extent of their journey is not known; about six months later, individuals are noted on southward passage in Queensland from February to April, arriving in New South Wales and Victoria somewhat later. On the western side of the ranges, and in northern Australia, whistler populations appear to remain throughout the year. Age-related and sex-related differences in the timing of movements observed at some localities have not been recorded at others.

The Golden Whistler appears not to have the same degree of north-south movement, some of its populations being present in the same place throughout the year. In addition to any movements that may occur, there are varying degrees of altitudinal shifts in the non-breeding season as the birds at higher elevations descend to lower ones and into more open habitat. This movement is undertaken at different times according to age-class and sex, and also with regional variation. In some localities, in some areas, adult females and juveniles shift before adult males do; at others, the adult females may not move at all. Following extensive ringing of Golden Whistlers, almost all retraps, as many as 99.7% of the total, have been at sites less than 10 km from where the birds were initially captured; just 0.3% have been at a greater distance than this. In Vanuatu, it is reported that non-breeding individuals display extensive local wandering, but it is not known whether these are adults or immatures.

The wide distribution of Golden Whistlers, particularly of the more recently colonizing group, indicates that these are capable of extensive movements. Studies throughout the range of this species are, however, too few to enable the detection of any inter-island transits that may be occurring.

### Relationship with Man

The loud, musical voices of these birds ensure that their songs, at least, are noticed by many people. A number of species are not particularly shy, but often will not be seen unless a particular effort is made to locate them. Indigenous peoples are much

more aware of these birds. Their knowledge, however, is infrequently presented in a forum where it could be more widely disseminated.

I. S. Majnep, in conjunction with R. Bulmer, presented local names for and information on several species from the Kalam people in the Kaironk Valley, in the Schrader Range of east-central New Guinea. The Rufous-naped Whistler receives its Kalam name, *sweg*, from its loud "suweee" call. Other vocalizations can be rendered roughly as *mwng ayp* or *mwng ayg asap*, meaning "the raindrops are pattering" or "the raindrops are going to fall"; the call of this species is regarded as a sign of rain. The call of the Regent Whistler is transliterated as *tw pc pc*, or more literally "axe chop chop"; it is taken as a sign of good weather, so the bird is telling people to work at clearing their gardens. The fruit-eating habits of the Mottled Whistler are acknowledged in the name *gwpr-magl-ket*, or "haunts the fruit of the *gwpr*", the latter being the *Homalanthus* trees. The wattles of the male Wattled Ploughbill are recognized in the Kalam names of *senngblwen*, meaning "possesses wattles", and, more lyrically, *senng twmd-bad-sek*, or "protruding ears". The poisonous nature of the Hooded Pitohui (see Morphological Aspects) is well known to the Kalam people. This species is usually avoided, but, if taken for food, it can be eaten only after special preparation; the skin is noted as being bitter and as puckering the mouth. The local name of the Hooded Pitohui, *wobob*, is derived from the species' loud whistling call; *wobob*, however, also means a kind of skin disease, and in the phrase *slk-wobob-sek*, *slk* it means both "bitter" and "itchy". Familiarity with the pitohui's toxicity is also evident among people in the Finisterre Range of north-east New Guinea. Here, the name *kok isip* means "irritant to the intestines".

In the Lesser Sunda Islands, a myth of the Nage people of interior Flores relates how a mistreated little girl was transformed into a Bare-throated Whistler, or *kete dhengi*. It is suggested that the bird embodies the girl's spirit, as infant souls and aborted fetuses also become Bare-throated Whistlers.

In Australia, the loud voices of pachycephalids brought these birds to the attention of the early colonists and farmers, as they had earlier to the Aborigines. Many interesting colloquial names were applied to them, often reflecting their vocalizations. Several species of whistler were referred to as "thunderbird", because of their habit of reacting to thunder and other loud noises

The **Green-backed Whistler** is a restricted-range species that occurs only in the Endemic Bird Areas of Luzon and Mindoro, in the Philippines. Remaining forest habitat on these islands is very scarce, particularly on Mindoro, which was almost entirely deforested by 1988. Nevertheless, the Green-backed Whistler is common to abundant in some localities, and tends to be more numerous in hill and montane forest above 1000 m. As a consequence, it is not considered globally threatened, unlike many other species of these two EBAs.

[*Pachycephala albiventris crissalis*, near Coto, Zambales province, Luzon, Philippines.  
Photo: Doug Wechsler/VIREQ]



with bursts of song. "Mock whipbird" was applied to the Rufous Whistler because of its explosive song, and "Echong" was a close transliteration of one of its frequently heard phrases. The distinctive voice of the Crested Bellbird spawned numerous onomatopoeic Aboriginal names, and the phrasing of the song is captured with impressive consistency in the many names, such as *wunnbunpullulla* and *panpanpalala*. Early observers remarked on the similarity of the bellbird's notes to the sounds produced by bells used on cattle and camels. They noted also the displeasure of the people attempting to control these animals, as either drovers or stock could be fooled by the Crested Bellbird into thinking that it was time to move.

Owing to its trusting nature, the Grey Shrike-thrush was perhaps the Australian pachycephalid best known to European settlers. Early reports of this bird's tameness around habitations were not uncommon. In addition to its habit of nesting on verandahs, some individuals learned to sing until they were fed, or to enter kitchens in search of handouts, and in one instance one landed on a sleeping person's bed to "encourage" him to get up and provide food. The Grey Shrike-thrush received an array of colloquial names, several of which allude to some of this species' calls, whereas others are less obvious: "Harmonious Thrush", "Whistling Dick", "Duke Wellington", "Joe Wickie", "Jock Whitty" and "Pluff". Aboriginal names such as *jurru-jurru*, *witraewill-kurakk* and *wititata* likewise reflect its vocalizations.

It is presumably because of their voices that several of the members of this family have been kept as cagebirds. One such is the Bare-throated Whistler, and this species could even be put at risk by the level of trapping for the trade (see Status and Conservation). A number of other whistlers are popular among cagebird-keepers and are trapped in considerable numbers.

### Status and Conservation

Disregarding the now extinct Piopio, which may, in any case, not be a member of the Pachycephalidae (see Systematics), the most precarious conservation status of any species in this family is that of the Sangihe Shrike-thrush. For over a century after its original discovery, in 1881, this species was regarded as either erroneously identified or extinct. Its rediscovery in 1985,

at a single site on the small island of Sangihe, off north Sulawesi, helped to confirm that it was, indeed, a valid species. At the time of its rediscovery, a number of individuals were heard to be singing. On a subsequent visit in 1998–1999, the shrike-thrush was much more difficult to find. It is known only from one small mountain, Gunung Sahendaruman, and has a global range totalling no more than about 15 km<sup>2</sup>, and a population tentatively estimated at 640 individuals; even this figure may be too high, and fewer than 100 birds is possibly a more realistic estimate. Almost all of the island has been cleared of primary rainforest, the essential habitat for this species. Remaining stands of forest are small and fragmented, and clearance work continues. Conservation of the remaining forest at Mount

The appropriately named **Sulphur-bellied Whistler** is listed as a restricted-range species. It occurs only in the Sulawesi EBA, where it mainly inhabits primary forest from sea-level up to 2500 metres. The species is not apparently well able to tolerate habitat modification and clearance, its population density decreasing from primary to secondary forest and from there to mixed rural habitat and plantations. Nevertheless, it is reported to be still common and widespread for the time being.

[*Pachycephala sulfuriventer*, Anaso, Lore Lindu National Park, NC Sulawesi, Indonesia.  
Photo: Bernard Van Eiegem]







Four shrike-thrushes are classed as restricted-range species, one being the **Morningbird**. This sooty-brown pachycephalid occurs only on the group of islands that form the Palau EBA. Although only a small proportion of the area is formally protected, dense, tropical, broadleaf forests still cover most islands in the archipelago. As a result, the Morningbird remains moderately common in at least parts of its range, particularly on the smaller islands. It is not considered globally threatened, and its future, like that of most birds endemic to Palau, seems relatively secure.

[*Colluricincla tenebrosa*, Palau.

Photo: Mandy Etpison]

Sahendaruman is critical for the survival of this species. Formerly, it probably occurred on the slopes of Mount Awu but, if so, it is likely now extinct owing to loss of forest habitat. Nonetheless, remnants of disturbed forest remain in very steep mid-mountain ravines, and these need to be checked for the species' presence. The Sangihe Shrike-thrush has been recognized as a protected species, but responsible officials are failing to address problems facing it, such as the intrusion of agriculture. Because of its small population size and restricted distribution, coupled with the ongoing and extensive habitat degradation in its range, the Sangihe Shrike-thrush is regarded as Critically Endangered.

The Yellowhead was once abundant in the South Island of New Zealand, but it is now restricted to areas retaining large tracts of native forest, having disappeared from 75% of its former range. Much of this dramatic decline has occurred since the 1960s, although it started as long ago as the 1880s. This species is vulnerable to the loss of suitable nesting and feeding trees as a result of clearance and habitat modification. It also falls victim to introduced predators, particularly stoats and black rats. These feral mammals have periodic population explosions, when the great increase in their numbers exerts extra pressure on local populations of Yellowheads, with a marked loss of individuals of the latter. The New Zealand wildlife officials have instigated control programmes targeted at stoats. In places where these have been carried out, the numbers of Yellowheads have increased. The Yellowhead is listed in New Zealand as "Threatened" and is classed by BirdLife International as Engangered.

Two other, closely related New Zealand species, the Whitehead and the New Zealand Brown Creeper, are not considered globally threatened, but they, too, have suffered the effects of habitat loss and introduced predators. The Whitehead has been extirpated from large parts of its former range in the North Island. It has benefited from successful reintroductions on predator-free islands. Both it and the New Zealand Brown Creeper have demonstrated an ability to adapt to exotic conifer plantations.

Although not regarded as globally threatened, the Red-lored Whistler is listed as Near-threatened. Its total Australian population numbers possibly fewer than 10,000 mature adults, and the species is considered "Endangered" in New South Wales. It has lost at least half of its mallee habitat, but that remaining is rela-

tively intact and largely protected in reserves. Some clearance continues, but perhaps of more concern is the vulnerability of mallee to fire. Large tracts can burn at one time, and it has been found that the Red-lored Whistler does not recolonize a burnt area until at least five years after fire. The habitat can also become too tall for this species. The practice of harvesting broombush (*Melaleuca uncinata*), a major vegetation component of these areas, may assist in maintaining an optimal height, but such harvesting must, of course, always be conducted outside the breeding season. In some areas, there is evidence that the Red-lored Whistler is being replaced by the related but ecologically more flexible Gilbert's Whistler.

Habitat loss and modification pose a threat also to the Bare-throated Whistler. This pachycephalid remains common in suitable habitat on Flores and Sumbawa, but this is increasingly restricted, totalling less than 2000 km<sup>2</sup> and perhaps closer to 1500 km<sup>2</sup>. Another threat arises from this whistler's skill as a songster. It is popular as a cagebird, and there is a high level of trapping on Sumbawa for this trade. Subsequent survival is low: only about 10–20% of captured individuals arrive at the market alive, and few of these survive beyond one year. If this species were more easily captured, the situation would be considerably worse. It is currently listed as a species of Least Concern, but a transfer to the conservation status of Near-threatened may be warranted.

The Shrike-tit is not globally threatened, either, but all of its populations have declined, and some are of particular concern. Eastern, nominate populations are sensitive to logging. Although they have been recorded in regrowth more than 50 years after logging, they have not been found in stands of 25–35 years. The south-western subspecies, *leucogaster*, is classed as "Near-threatened" and the northern subspecies, *whitei*, "Endangered". The south-western population has declined as a result of the clearance of forest and woodland for agriculture, mainly for wheat-growing. Local extinctions are frequent because the species requires large stands of habitat, and usually disappears from those of less than 1100 ha. The northern subspecies is poorly known. It has been recorded from fewer than 30 localities, with no recent reports from areas where it was originally collected. The population, estimated at 2500 mature individuals, is probably declining, with subpopulations possibly quite isolated.

An interesting hypothesis to explain the scarcity of the Shrike-tit in the south-west compared with eastern Australia involves regional differences in the feeding substrates exploited. In the east, several species of eucalypt have decorticated bark, and Shrike-tits specialize on this for foraging. South-western forests have far fewer trees with similarly loose bark, and Shrike-tits here are more reliant on feeding from foliage. Nutrient levels in the soil are lower than those in eastern Australia, and this is reflected in the reduced nutritional value of the foliage. In turn, leaves are able to support fewer invertebrates. In order to obtain sufficient food, south-western Shrike-tit pairs have to occupy larger home ranges, and consequently occur at lower densities, than do those in the east. A similar situation appears to occur in northern Australia.

Some New Guinea species, such as the White-bellied Pitohui and the Sooty Shrike-thrush, are too poorly known for their status to be assessed with any degree of reliability. In some instances, this may reflect restricted distributions or specialized habitat requirements, or it may be more an indication of the lack of ornithological observers in much of a species' range. Notwithstanding this, the White-bellied Pitohui is currently listed by BirdLife International as Near-threatened. It is known from just two very small areas in New Guinea, in both of which it appears to be reasonably common. Its exceedingly small global range is presumably the reason for its listed conservation status.

Finally, the Tongan Whistler is likewise classed as Near-threatened. It is reported as common and widespread within its range, which is restricted to the Vava'u group of islands in Tonga. Its preferred habitat is native forest, little of which remains, and it now inhabits the understorey in successional habitats next to mature forest. In addition, introduced mammals on the islands include two species of rat, both likely predators on the whistler, and several non-native ungulates, which tend to overgraze and overbrowse the vegetation of the understorey. If further loss and degradation of its habitat occur, the Tongan Whistler could soon become threatened.

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Yet another restricted-range species, the **Red-fored Whistler** occurs only in the South-east Australia EBA. It inhabits moderately dense and well-established undergrowth of low mallee woodland. Over half of this habitat has already been cleared. While it is fortunate that most remaining stands are in reserves, these areas are susceptible to fire. This poses a problem as it takes five years for the undergrowth to develop sufficiently for the whistler to recolonize. As a result, the species is considered Near-threatened. Its total population is thought to number under 10,000 birds.

[*Pachycephala rufogularis*, Gluepot South, Australia. Photo: Peter Fuller]

The **Yellowhead** is a restricted-range species, occurring only in the South Island of New Zealand EBA. Once abundant, the species has disappeared from 75% of its former range, and now survives only in the large tracts of forest that have escaped clearance or modification. The Yellowhead also falls victim to introduced mammalian predators, the latter's population explosions causing local extinctions. It is striking that, at localities where control programmes have targeted stoats, Yellowhead numbers have increased. The species is listed as Endangered, with just some 2000-3000 birds left.

[*Mohoua ochrocephala*, South Island, New Zealand. Photo: Don Hadden/Ardea]



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PLATE 31

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## Genus *PACHYCAR* Gould, 1876

### 1. Goldenface

#### *Pachycare flavogriseum*

**French:** Pachycare nain **German:** Goldstirn-Dickkopf **Spanish:** Silbador Enano  
**Other common names:** Dwarf Whistler, Golden-faced Pachycare, Grey-and-yellow Flycatcher

**Taxonomy.** *Pachycephala flavogrisea* A. B. Meyer, 1874, Arfak Mountains, New Guinea. Affinities uncertain. Bright yellow underparts and strong voice suggest possible relationship with the whistlers, but other plumage characters, and behaviour, indicate less of a connection; alliance with Australasian robins (Petroicidae) suggested by some authors; nest, however, is unlike those of other members of present family or those of petroicids. Closest relatives perhaps in the family Acanthizidae, some members of which have nest architecture similar to that of present species. Further research required. Racial identification of museum specimens possibly confounded by post-mortem fading of underpart colour; races *subpallidum* and *subaurantium* grade into each other in Sepik Mts. Four subspecies recognized.

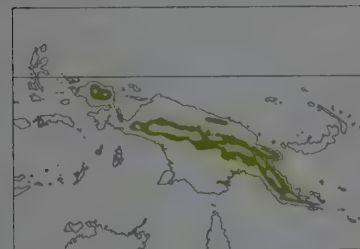
#### **Subspecies and Distribution.**

*P. f. flavogriseum* (A. B. Meyer, 1874) – Vogelkop (Arfak Mts, Tamrau Mts) and Wandammen Mts, in W New Guinea.

*P. f. subaurantium* Rothschild & E. J. O. Hartert, 1911 – C New Guinea in Weyland Mts, S slopes of Nassau Mts, Oranje Mts and Victor Emanuel Mts E probably to Mt Karimui.

*P. f. randi* Gilliard, 1961 – R Idenburg, in N New Guinea.

*P. f. subpallidum* E. J. O. Hartert, 1930 – New Guinea E & SE from Torricelli Mts, Sepik Mts, Huon Peninsula (Saruwaged Mts), Herzog Mts and, in S, Eastern Highlands Province (probably from Okasa).



**Descriptive notes.** 13 cm; 14–19 g. Male nominate race has crown and hindneck light bluish-grey, separated by black stripe from bright yellow forehead, broad supercilium and ear-coverts; upperparts light bluish-grey, upperwing with outer primaries dusky grey, inner primaries and secondaries bluish-grey, tertials bluish-grey with black inner webs, each tipped white, wing-coverts bluish-grey; tail bluish-grey, all except central pair of feathers with black subterminal marking on inner webs; throat and underparts bright yellow; iris brown to dark brown; bill black; legs light brown to brown. Female is like male, but ear-coverts

with dusky patch, black on forecrown reduced. Immature apparently resembles female. Race *subaurantium* has underparts darker, with more orange tinge; *randi* is even more orange below; *subpallidum* is palest, with most yellow (least orange-tinged) underparts. **Voice.** Song is variations on loud upslurred whistle of 2 (sometimes 3–4) notes, “wheep wheep”, followed by lower-pitched double “chew chew”, each series increasing in volume. Contact calls near nest a high-pitched twittering and low-volume trills.

**Habitat.** Hill and lower montane forest, also neighbouring secondary growth; often in thicker vegetation, occasionally in more open regrowth. At 400–1800 m, mainly 800–1650 m.

**Food and Feeding.** Insects and spiders (Araneae). Forages in outer foliage, about equally in lower and middle storeys, occasionally in higher storey. Gleans prey from leaves and twigs. Sometimes joins mixed-species foraging flocks.

**Breeding.** Males with enlarged testes in Aug. and laying female in early Oct; egg found in mid-Jun. and nestlings in late Nov. Nest built by both adults, globular with downward-facing side entrance and small vestibule, external diameter 15–18 cm, has double-layer base platform of straight dry twigs, placed on which is a woven ball of fairly decayed leaf strips (not incorporated into platform), lined inside with more tightly woven dry moss, lichen filaments or grass, structure capped with dense layer of decomposing leaves which somewhat overhang entrance; placed on ground against downhill base of sapling or small tree on slope. Clutch 2 eggs, whitish-pink to rose-white, sparsely to densely marked all over with fine blotches, spots and smears of russet maroon, rufous-pink and purple, sometimes wreath of larger dark greyish to rusty rufous-brown blotches near broader end, 20.5–22.3 × 15–16.5 mm. No further information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Common in upper part of altitudinal range; much less so at lower elevations.

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## Genus *EULACESTOMA* De Vis, 1894

### 2. Wattled Ploughbill

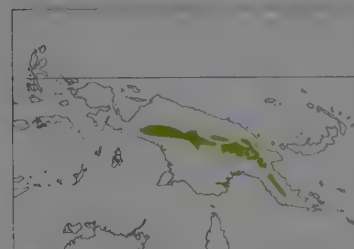
#### *Eulacestoma nigropectus*

**French:** Écorceur caronculé **German:** Lappendickkopf **Spanish:** Silbador Picoarado  
**Other common names:** Wattled Shrike-tit, Ploughshare Tit

**Taxonomy.** *Eulacestoma nigropectus* De Vis, 1894, Mount Maneao, south-east New Guinea.

Affinities uncertain. A recent proposal separates present genus and *Falcunculus* in a narrow family Falcunculidae. Proposed race *clara*, from C ranges (Weyland Mts E to Mt Hagen and Kubor Mts), considered inseparable from populations elsewhere. Monotypic.

**Distribution.** C & E New Guinea from Weyland Mts E to mountains of SE.



**Descriptive notes.** 12.5–14 cm; 19–22 g. Distinctive, with deep bill laterally compressed, upper mandible hooked. Male has top of head and upperparts ochraceous olive, more golden on forehead, face and scapulars, lores black, large circular rose-pink wattle from gape to side of throat on each side; upperwing sooty black or blackish-brown, remiges edged olive-green, wing-coverts sooty black; tail blackish-brown, rectrices edged olive-green; chin and upper throat yellow, lower throat and breast black with olive feather fringes, remainder of underparts olive-green; iris dark reddish-brown; bill sooty black; legs grey. Female lacks

wattle, is ochraceous olive above, pale olive below, breast faintly barred whitish, iris brown, bill greyer. Juvenile is rusty chestnut above, wing-coverts rusty, remiges and rectrices edged with rusty chestnut, breast grey with rusty wash; immature like female, but retains juvenile wing-coverts. **Voice.** Includes thin level whistle, series of c. 6 alternately rising and falling whistles, and repeated buzzy note.

**Habitat.** Forest and adjoining areas with dense regrowth, mainly at 1950–2850 m, locally down to 1250 m in SE. Frequents substage and midstage, particularly thickets of climbing bamboo.

**Food and Feeding.** Insects. Forages from understorey to middle stage, to c. 10 m, particularly in thickets of climbing bamboo. Gleans prey from surfaces of branches and twigs, especially broken tips when these dead and dry; removes bark by chipping and stripping, digs for prey in bark and moss. Will lean with head downwards over limb to examine underside for prey. Often joins mixed-species feeding flocks.

**Breeding.** Juveniles in May and late Jun and female in breeding condition in Jul, indicative of breeding during both wet and dry seasons. Incubation by male reported; role of female unknown, but presumably shares duty. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains EBA. Rare to uncommon in most of range; locally fairly common in SE.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Diamond (1972), Finch (1981a), Frith & Frieh (1993b), Hartert *et al.* (1936), Iredale (1956), Majne & Bulmer (1977), Mayr & Gilliard (1954), Mayr & Rand (1937), Rand & Gilliard (1967), Sims (1956), Stresemann & Paludan (1935).

## Genus *FALCUNCULUS* Vieillot, 1816

### 3. Shrike-tit

#### *Falcunculus frontatus*

**French:** Falconelle à casque **German:** Meisendickkopf **Spanish:** Silbador Cabezón  
**Other common names:** Crested/White-bellied/Yellow-breasted/Frontal/Australian Shrike-tit, Bark Tit, Crested Tit, Falcon-shrike; Eastern Shrike-tit (*frontatus*); Western Shrike-tit (*leucogaster*); Northern/White's Shrike-tit (*whitei*)

**Taxonomy.** *L[anius] frontatus* Latham, 1801, Sydney, New South Wales, Australia.

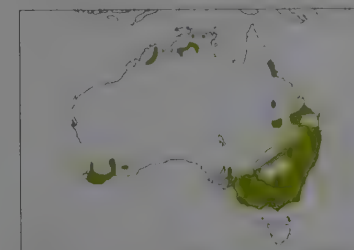
Has in the past been placed together with *Oreocica gutturalis* in a family Falcunculidae, often including also the whipbirds and wedgebills (*Psophodes*) from the family Eupetidae; the main basis for this is apparently the fact that all have crests, but no other evidence for such an association. A more recent proposal treats Falcunculidae as including only present genus and *Eulacestoma*. Races sometimes treated as three distinct species, an arrangement warranting further examination. Three subspecies recognized.

#### **Subspecies and Distribution.**

*F. f. whitei* A. J. Campbell, 1910 – N Western Australia and N Northern Territory.

*F. f. leucogaster* Gould, 1838 – SW Western Australia.

*F. f. frontatus* (Latham, 1801) – E & SE Australia (S from NE Queensland and E from SE South Australia).



**Descriptive notes.** 16–19 cm; 27–33 g. Distinctive head pattern, with crown and nape feathers formed into crest; deep bill laterally compressed. Male nominate race has median crownstripe from centre of forehead to hindneck black, side of crown and upper face to upper hindneck white, black eyestripe broadening behind eye and through ear-coverts to hindneck; lores and malar region white; upperparts olive to yellow-olive; upperwing grey, remiges and wing-coverts edged pale grey; tail grey, outermost rectrix narrowly edged white on outer web; chin, throat and breast black, remainder of underparts yellow,

tinged olive on sides of breast, belly and flanks; iris dark reddish-brown; bill black; legs dark grey. Female is similar to male, but throat dark olive-green, bill not so long and less deep. Juvenile has upperparts cinnamon-rufous, wing-coverts rufous-brown, throat yellow; immature like female except for retained juvenile wing-coverts. Race *leucogaster* has belly white, not yellow; *whitei* is smaller than others, somewhat paler above, with remiges and rectrices prominently edged yellow. **Voice.** Song of nominate race a high-pitched, piping, drawn-out, descending whistle, described as

On following pages: 4. Crested Bellbird (*Oreocica gutturalis*); 5. Rufous-naped Whistler (*Aleadyrus rufinucha*); 6. Mottled Whistler (*Rhagologus leucostigma*); 7. Yellow-flanked Whistler (*Hylacitrea bonensis*); 8. Maroon-backed Whistler (*Coracornis raveni*); 9. Olive Whistler (*Pachycephala olivacea*); 10. Red-lored Whistler (*Pachycephala rufogularis*); 11. Gilbert's Whistler (*Pachycephala inornata*); 12. Rusty Whistler (*Pachycephala hyperythra*).



harsh and mellow. "keen-keep-keep..." also as monotone starting soft and then increasing in volume; *whitei* has series of descending and then ascending notes, also double whistle with second note drawn out; *leucogaster* gives soft clear "twice-two-two" or "pee-oo-pee-e". Scolding call "grt-tut-tut".

**Habitat.** Mainly eucalypt (*Eucalyptus*) forest and woodland, riparian vegetation in drier country, occasionally rainforest. In E of range, dry sclerophyll forest and woodland, less often in wet sclerophyll and in woodland dominated by *Callitris* and *Casuarina* species, occasionally in park and gardens, rarely coastal scrub and exotic pine (*Pinus*) plantations. In N (race *whitei*) inhabits eucalypt woodlands; in SW (*leucogaster*) eucalypt forest and woodlands. Lowlands to low mountains, to 900 m in NE Queensland and 1200 m in Victoria.

**Food and Feeding.** Invertebrates, mainly insects, some spiders (Araneae); also fruit, seeds and arils. At one site, 50% of diet insect larvae, most of remainder adult beetles (Coleoptera) and spiders; male took larger prey items than female. Forages at all heights, in E mainly above 6–10 m in subcanopy and canopy, in one study in shrubs (0.2–4 m) 17%, subcanopy (4–10 m) 47% and canopy (above 10 m) 36%; and in another foraging on ground 0.6%, at 1–2 m 6.3%, 3–5 m 14.7%, 6–9 m 35.3%, 10–14 m 39.8% and above 15 m 3.3%; in SW range (race *leucogaster*) in shrub and sapling layer (0–7%), subcanopy (25–100%) and canopy 0–68%. Sexes may forage at same height at some sites, different heights elsewhere; at one site male c. 85% of time below 12 m and female c. 80% above 9 m, at another site males fed higher in trees than did females. Forages on branches (62–90%), sometimes in foliage (4–32%); in E, exploits trees with decorticating ribbon-like bark on smooth trunk in preference to those with rough bark, and 63–96% of foraging on bark and 4–37% on foliage; in SW, where loose bark less frequent, feeds more from foliage (67–75%) than from bark (25–27%). Differences between sexes observed: male preferred dead branches and large coiled ribbons of bark, female preferred leaves, petioles and galls. Hunts prey items by picking from or under bark, which may be torn or pulled away (45–90%), also by probing in bark (4–13%) and gleaning from vegetation surface (8–42%), also by hang-gleaning (0–7%); in SW, more reliant on gleaning (46–58%) and hang-gleaning (23–29%) than on probing and pulling (13–25%). Will break off small twig (c. 4 cm), hold it in bill, and poke it into crevice to force out insect. Holds prey with foot, bashing some items against branch; removes head and viscera of caterpillars before eating.

**Breeding.** Season late Aug to early Jan in E (nominate race); eggs recorded late Nov and Mar in N (*whitei*) and early Nov in SW (*leucogaster*); usually double-brooded. Breeds as simple pair, occasionally with auxiliaries. Territorial when breeding and for much of year. Nest built by female, a deep cup, or inverted cone with cup-like cavity on top, made from bark strips and dry grass, heavily covered externally with spider web and occasionally lichen or moss, lined with fine strips of bark and grass. External diameter 7–6 cm, height 7.6–10.2 cm, internal diameter 3.8–5.1 cm, depth 3.8–5.7 cm; placed 3–30 m (usually 6–15 m) above ground in vertical fork, often three-pronged, in upper canopy, adults pull or bite off foliage and new shoots above and just below nest and strip bark from branchlets to c. 50 cm (occasionally to 2 m) around nest. Clutch 2–3 eggs, usually 3, white with small spots and blotches (sometimes squiggles) of brown, olive and grey, mainly at large end, sizes 23.1–24.9 × 16.3–17.7 mm (nominate; *leucogaster* similar), 20.3–24.6 × 15.2–17 mm (*whitei*); incubation mostly by female, some help from male, period 18–20 days; chicks brooded and fed by both sexes, fed also by any helpers present, nestling period 15–17 days (21 days also reported); fledglings cared for by parents for at least 3 months, possibly to 6 months. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*), Brush Cuckoo (*Cacomantis variolosus*) and Fan-tailed Cuckoo (*Trochoceros bairdii*).

**Movements.** Largely sedentary; some local movements, mainly in autumn–winter. Present in some localities all year, in others appears only in certain seasons. Longest recorded movement of marked individual 10 km.

**Status and Conservation.** Not globally threatened. Nominate race fairly common in appropriate habitat, but has declined in some areas; recorded in regrowth more than 50 years since logging, but not in regrowth 25–35 years old. Other races less numerous, both of conservation concern. N race (*whitei*) has estimated population of 2500 mature individuals, and is probably declining; perhaps always occurred at low density, known from fewer than 30 localities, with no recent reports from some sites where formerly recorded; classed in Australia as "Endangered". SW race (*leucogaster*) has declined in abundance, with local extinctions as a result of habitat clearance for agriculture, mainly for wheat; usually disappears from habitat remnants, and apparently unable to persist in forest fragments of 1100 ha or less; considered "Near-threatened". Effects of changed fire regime on occurrence of bark invertebrates may be the main factor causing declines. Also suggested that low frequency of decorticating bark in N & SW forces greater reliance on foliage-gleaning, but low levels of nutrients in soil result in lower nutritional value of foliage (and therefore fewer invertebrates supported); consequently, pairs of this species require greater home ranges and so occur at lower densities. In view of the low density of these birds, subpopulations may be quite

**Bibliography.** Abbott (1999), Anon. (1917), Barrett *et al.* (2003), Beruldsen (1965), Binns (1961), Boles (1988), Campbell (1901), Chisholm (1915), Coleman (1972), Ford *et al.* (1986), Franklin *et al.* (1997), Galbraith (1974c), Garnett & Crowley (2000), Higgins & Peter (2002), Hill (1911), Hindwood (1947), Holmes & Recher (1986), Howe (1928), Howe & Noske (1980), Johnstone & Storr (2004), Joseph & Reid (1981), Leach (1928), Marchant (1985b), Mathews (1923b), Mattingley (1914), Mayr (1953a), North (1906), Noske (1985b, 2003a, 2003b), Recher (2006), Recher & Holmes (1985, 2000), Recher *et al.* (1985), Richards (1971), Rix (1970, 1976), Robinson & Woinarski (1992), Schodde & Mason (1999), Sedgwick (1988b), Serventy & Whittell (1976), Smith (1985), Whitleck (1911, 1912), Whittell (1952).

## Genus *OREOICA* Gould, 1838

### 4. Crested Bellbird

#### *Oreoica gutturalis*

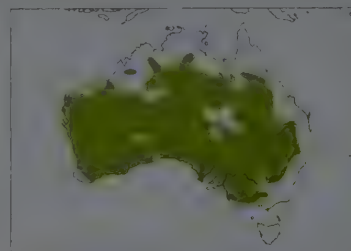
**French:** Carillonneur à crête **German:** Häubchenfalkner **Spanish:** Silbador Campanillero  
**Other common names:** Bellbird, Crested Oreoica

**Taxonomy.** *Falcunculus gutturalis* Vigors and Horsfield, 1827. "Kent's Group, Bass Strait", Australia. Has in the past been placed with *Falcunculus frontatus* in the family Falcunculidae, often including also the whipbirds and wedgebills (*Psophodes*) from the family Eupetidae; basis for this apparently the fact that all possess a crest, but no other evidence for such an association. Present species sometimes placed close to genus *Callineta* (to which it resembles *Callineta armata*) in size and shape, and females of the two are similar to each other in plumage; recent molecular-genetic studies, however, hint at closer relationship with *Ptilopus*. Races intergrade. Two subspecies recognized.

#### Subspecies and Distribution.

*O. g. pallescens* Mathews, 1912 – Western Australia (except SW & S), Northern Territory (except N), South Australia (except S) and W & C Queensland.

*O. g. gutturalis* (Vigors & Horsfield, 1827) – SW & S Western Australia, S third of South Australia, SC Queensland, W two-thirds of New South Wales and N Victoria.



**Descriptive notes.** 19–23 cm; 56–67 g. Male nominate race has centre of forehead and crown to nape black, feathers elongated as crest, sides of crown and head from eye to nape grey, hindneck and neck side greyish-brown; side of forehead and lores white, chin and upper throat white, these accentuated by black band extending from crest through orbit on to anterior cheek, throat side and as broad band on central breast; upperparts grey-brown, rump tinged chestnut, upperwing dark brownish-grey, feathers edged pale greyish-brown, tail brown; breast side, flanks and thighs light greyish-brown, belly and crissum off-white,

undertail-coverts dark buff; iris reddish-orange; bill black; legs grey. Female is like male but lacking strong facial pattern, has head brownish-grey, centre of forehead and crown with elongate black feathers; chin and throat off-white, underparts paler; iris yellow to red-brown. Juvenile is mainly brown, with pale shaft streaks on body feathers, buff edging on remiges and wing-coverts; first immature similar to adult female, but with retained juvenile buff edges on wing feathers, iris brown; second immature male like adult female, but lores, chin and upper throat white, face and breastband mottled (not solidly black), iris light brown. Race *pallescens* is slightly smaller than nominate, male with significantly shorter wing, both sexes also paler (especially on upperparts), male with more white on forehead. Voice. Song with ringing, ventriloqual quality, starting softly and then intensifying, opening notes usually monotone, final 3 notes quicker, last one lower and liquid, like ringing of cowbell or sound made by stone dropped in pool, transcribed variously as "pan pan panella", "dick-dick-the devil" or "did did dididee-dit"; sometimes performed antiphonally. Call "chuck" or "chucka chucka chucka"; scolds with "tut-tut-tut".

**Habitat.** Drier wooded habitats, particularly eucalypt (*Eucalyptus*) woodland, including mallee, and dry acacia (*Acacia*) woodland and shrublands, also in regions characterized by spinifex (*Triodia*) and chenopods with scattered trees.

**Food and Feeding.** Invertebrates, mainly insects; some seeds. Forages mainly on ground, occasionally in dense vegetation in low shrubs; sometimes to higher levels in trees. Picks food items from ground or gleans from vegetation. Bashes larger prey on hard surface to subdue it. Sometimes joins mixed-species foraging flocks.

**Breeding.** Eggs found late Jul to early Mar; some local variation according to rain. Territorial. Nest built by both sexes, a deep cup with outer structure of twigs, bark and leaves, inner structure (egg-chamber) of bark strips, lined with shredded bark, fine grass, rootlets, occasionally wool or hairs of caterpillars, also hairy caterpillars (often alive but paralysed) frequently added along rim or in bottom of nest before or during egg-laying; external diameter 12.7–14 cm, height 15.2 cm, internal diameter 10.2 cm, depth 6.4–7.6 cm; placed 0.2–3.8 m (usually c. 1.5 m) above ground in fork in branch or trunk of tree or in dense shrub, sometimes in hollow stump or trunk, in clump of mistletoe (*Loranthaceae*) or crown of grass-tree (*Xanthorrhoea*). Clutch 1–4 eggs, usually 2–3, white to pale bluish-white with black, olive, grey and brown spotting over lavender-grey blotches, markings small and evenly spaced or large and patchily distributed (particularly at larger end), size 24.6–28.4 × 19.6–21.1 mm; incubation starts before last eggs laid, by both sexes, period 14–17 days; chicks hatch asynchronously, brooded and fed by both parents, nestling period 11–12 days; young not always able to fly when led away by adult. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Hatching success 63–71%; fledging success 33%.

**Movements.** Present throughout year at some localities; alleged to move widely in winter or to be nomadic in places, but little evidence to date. Few recoveries of marked birds, all less than 10 km from site of original ringing, except for one individual that moved 178 km over 28 months.

**Status and Conservation.** Not globally threatened. Locally fairly common; widespread. Nominate race has disappeared from more than 50% of its range, particularly along S & E periphery, contracting towards inland areas. Much of this loss a result of clearance and fragmentation of habitat; appears quite sensitive to fragmentation, known to have become extinct in forest remnants of 1000–5000 ha. Other reasons for pre-clearance decline in parts of E Australia uncertain. Listed in S Australia as "Near-threatened". Occurs in Murray-Sunset National Park, in N Victoria.

**Bibliography.** Bausjon (1922), Barrett *et al.* (2003), Boles (1988), Campbell (1901), Carter (1903b), Chisholm (1919, 1946), Cooper (1962), Galbraith (1974c), Garnett & Crowley (2000), Hale (1956), Higgins & Peter (2002), Hindwood (1942, 1943), Johnstone & Storr (2004), Jones (1926), Leach (1928), Mathews (1923b), Mayr (1953b), McAllan (2001), Mees (1961), Milligan (1905), North (1906), Ross (1930), Schodde & Mason (1999), Schodde & McKean (1976), Serventy & Whittell (1976), Sutton (1924), White (1913).

## Genus *ALEADRYAS* Iredale, 1956

### 5. Rufous-naped Whistler

#### *Aleadyras rufinucha*

**French:** Siffleur à nuque rousse **German:** Rotnacken-Dickkopf **Spanish:** Silbador Nuquirrufo  
**Other common names:** Red-naped Whistler

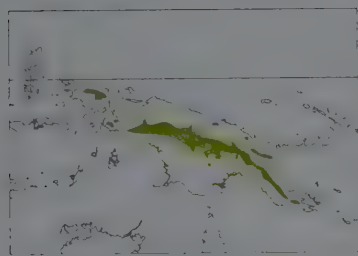
**Taxonomy.** *Pachycephala rufinucha* P. L. Slater, 1874. Hainan, Arfak Mountains, Vogelkop, New Guinea. Often placed in genus *Pachycephala*. Proposed race *prasinucha* (from Herzog Mts, regarded as inseparable from *gambeli*). Birds in Torricelli Mts and Aueiberti Mts of uncertain racial affiliation, provisionally included in *niveifrons*. Four subspecies recognized.

#### Subspecies and Distribution.

*A. r. rufinucha* (P. L. Slater, 1874) – Vogelkop (Tamaru Mts, Arfak Mts), in NW New Guinea.  
*A. r. niveifrons* (E. J. O. Hartert, 1930) – mountains of W, C & N New Guinea (Wandammen, Weyland, and Nassau E to Kubor and Bismarck Ranges, also Torricelli Mts and Adelbert Mts).  
*A. r. lochmia* (Mayr, 1931) – Huon Peninsula (Saruwaged Mts), in NE New Guinea.  
*A. r. gambeli* (Reithschild, 1897) – Herzog Mts and mountains of SE New Guinea.

**Descriptive notes.** 16.5–18 cm, 38–42 g. Nominant race has head and hindneck grey, rufous nape patch; upperparts dull yellowish-olive, flight-feathers blackish-brown, edged dull yellowish-ol-





ive, upperwing-coverts dull yellowish-olive, tail olive-brown; centre of chin dull white, throat yellow, centre of breast and belly white to creamy white, diffusely separated from olive sides of breast and belly and flanks, thighs dusky brown; iris whitish, buffy, yellowish or dark brown; bill black; legs brownish-grey to grey. Sexes alike: iris colour apparently palest in adult male. Juvenile is extensively reddish-chestnut, with iris dark brown, bill dark horn-brown; immature like adult but duller, nape and upperparts olive-green, head only slightly greyer, white underparts mottled olive. Race *niveifrons* has nape patch larger than

nominate, upperparts olive-green, forehead white with dark feather centres; *gamblei* is similar to previous, but dark centres of forehead feathers more extensive, underparts tinged brown; *lochmia* is also similar, but upperparts darker, flanks grey. Voice. Song of clear ringing whistles or upslurs, either alternating between notes or repeated monotonously for extensive periods. Call is a loud, harsh hiss.

**Habitat.** Mountain forest and secondary growth; 1200–3600 m, mainly 1400–2600 m.

**Food and Feeding.** Insects; also worms, and fruit. Credited locally with ability to take large prey. Frequents ground and understorey. Forages extensively on ground (c. 25%), and in undergrowth (c. 60%) and lower storey (c. 15%), occasionally to upper tree levels. Feeds mainly in inner third of trees on trunks and large branches. Creeps along branches and up vertical trunks.

**Breeding.** Nests with eggs in early Jun and late Dec, with eggs and young in mid-Oct and with young in early Dec, juveniles seen in late Mar to mid-May and in late Sept, and fledglings seen in mid-Jul; indicative of breeding during late dry season to early wet season and mid wet season to early dry season, at least. Nest a deep, bulky cup made from moss, ferns and coarse rootlets, lined with leaf skeletons, plant fibres and feathers, placed in vertical fork, usually fairly low but sometimes high up. Clutch 2 eggs, possibly sometimes 1, white, spotted with black and grey, 28–28.9 × 19.5–20.4 mm. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Not uncommon. Can appear to be uncommon or scarce, as it is fairly shy and infrequently seen.

**Bibliography.** Beehler *et al.* (1986), Bell (1971), Coates (1990), Croxall (1977), Diamond (1972), Gilliard & LeCroy (1961a), Gyldenstolpe (1955a), Harrison & Frith (1970), Hartert (1930), Hartert *et al.* (1936), Iredale (1956), Junge (1953), Majne & Bulmer (1977), Mayr (1931b), Mayr & Gilliard (1954), Mayr & Rand (1937), Peckover & Filewood (1976), Pratt (1982), Rand & Gilliard (1967), Rothschild & Hartert (1907), Salvadori (1881), Sims (1956).

## Genus RHAGOLOGUS

Stresemann & Paludan, 1934

### 6. Mottled Whistler

*Rhagologus leucostigma*

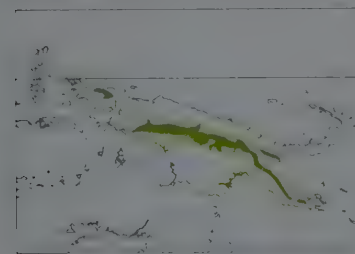
**French:** Siffleur maille **German:** Wellendickkopf **Spanish:** Silbador Moteado  
**Other common names:** Red-vented Whistler

**Taxonomy.** *Pachycephala leucostigma* Salvadori, 1876, Arfak Mountains, New Guinea. Often placed in genus *Pachycephala*. Three subspecies recognized.

**Subspecies and Distribution.**

*R. l. leucostigma* (Salvadori, 1876) – Vogelkop (Tamrau Mts, Arfak Mts), in NW New Guinea.  
*R. l. novus* Rand, 1940 – Weyland Mts and Nassau Range (R. Utakwa), in W New Guinea.

*R. l. obscurus* Rand, 1940 – mountains of C & SE New Guinea (E from R. Idenburg and, on S slope, from Mt Goliath) and of Huon Peninsula.



**Descriptive notes.** 15–16.5 cm; 24–29 g. Male nominate race has forehead and crown grey, feathers broadly edged olive, forehead with whitish spots, remainder of crown with pale shaft streaks; lores white, side of head dull rufous, feathers tipped black; hindneck brownish-olive, feathers with pale shaft streaks often enlarging into small spots near tip; upperparts brownish-olive, upper back with a few obscure spots; light-feathers brownish-grey, edged brownish-olive, upperwing-coverts brownish-olive, greater coverts edged brown and submarginally black; tail brownish-grey, rectrices faintly washed olive; chin dull rufous, underparts lighter with more distinct dark markings. Immature is like female. Race *novus* is darker than nominate above and below in both sexes, respectively, with markings reduced or absent, and rufous of head paler, male with edgings of remiges more olive; *obscurus* male is much plainer and duller, forehead and crown grey with feather edges indistinct, side of head dusky olive-grey and faintly mottled, back unmarked dark brownish-olive, greater coverts edged grey, throat grey with black feather edge, breast and belly greyish-olive, female like previous, but underparts paler without buff tinge. Voice. Song a loud series of varied notes, similar to some of *Chrysomitris*.

**Habitat.** Lower montane forest, occasionally secondary growth; 820–2530 m, mainly above 1500 m, occasionally to 2900 m.

**Food and Feeding.** Little information. Berries (to at least 9 mm in diameter), sometimes insects. Found usually in lower and middle storeys, sometimes in canopy.

**Breeding.** Male with enlarged testes in Jul. Nest a cup of tendrils with some moss, external diameter c. 13–14 cm, external depth c. 10–11 cm, placed c. 4 m from ground in outer part of tree, where woven around and supported by thin branches. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Poorly known. Apparently usually uncommon, but inconspicuous and easily missed; may be fairly common locally.

**Bibliography.** Beehler *et al.* (1986), Clapp (1994), Coates (1990), Diamond (1972), Gilliard & LeCroy (1968), Iredale (1956), Mayr (1931b), Ogilvie-Grant (1915), Rand (1940a), Rand & Gilliard (1967), Salvadori (1876a, 1881), Stein (1936).

## Genus HYLOCITREA Mathews, 1925

### 7. Yellow-flanked Whistler

*Hylocitrea bonensis*

**French:** Siffleur à flancs jaunes **German:** Olivflanken-Dickkopf **Spanish:** Silbador Flanquiamarillo

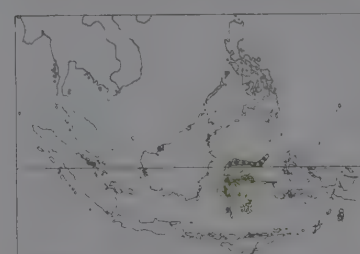
**Other common names:** Olive-flanked/Celebes/Sulawesi Whistler, Celebes Mountain Whistler, Buff-throated Thickhead/Whistler

**Taxonomy.** *Pachycephala bonensis* A. B. Meyer & Wilesworth, 1894, Bone Mountains, Sulawesi. Sometimes retained in genus *Pachycephala*, but differs in colour pattern, considerably reduced rictal bristles and more rounded wing. Two subspecies recognized.

**Subspecies and Distribution.**

*H. b. bonensis* (A. B. Meyer & Wilesworth, 1894) – mountains of N, C & SE Sulawesi.

*H. b. bonhaina* (A. B. Meyer & Wilesworth, 1896) – Mt Lombobattang, in SW Sulawesi.



**Descriptive notes.** 14–15 cm. Male nominate race has head greenish-olive, crown dark olive-brown, ear-coverts and superciliary area brighter, lores dusky; neck, mantle and upper back brownish slate-grey, middle and lower back, rump and uppertail-coverts yellow-olive; upperwing and tail brownish slate-grey, wing washed olive; brownish slate-grey below (somewhat lighter than back), chin, throat and to lesser extent breast washed olive, belly paler, flanks bright yellow-olive, undertail-coverts washed brownish-cinnamon; iris scarlet or dark brown; bill black; legs dark grey. Female is like male, but has crown yellowish-olive, throat

cinnamon-buff with grey streaking. Immature male has head and neck olive-brown, upperparts washed olive, underparts striped with pale brownish-buff. Race *bonhaina* male has crown dusky olive-green, ear-coverts yellowish-olive, grey of upper back extending to middle of back, breast more dusky brown, flanks more yellow. Voice. Song a series of high-pitched buzzy notes on same pitch. Call a loud piping.

**Habitat.** Montane forest, especially moss forest; 1200–3500 m, mainly above 2000 m.

**Food and Feeding.** Little known. Berries and some arthropods taken. Frequents middle storey and understorey. Joins mixed-species foraging flocks.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sulawesi EBA. Uncommon at lower part of range; moderately common to common at higher elevations. Occurs in Dumoga-Bone and Lore Lindu National Parks. Believed not to be at any risk for the present.

**Bibliography.** Coates & Bishop (1997), Hartert (1896), Meyer & Wilesworth (1898b), Riley (1919), Stresemann & Heinrich (1940b), Watling (1983), White & Bruce (1986).

## Genus CORACORNIS Riley, 1918

### 8. Maroon-backed Whistler

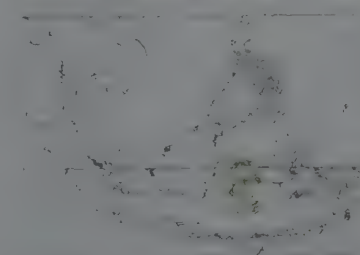
*Coracornis raveni*

**French:** Siffleur à dos marron **German:** Rotrückten-Dickkopf **Spanish:** Silbador Dorsicastaño  
**Other common names:** Rano Rano/Raven's Whistler

**Taxonomy.** *Coracornis raveni* Riley, 1918, Rano Rano, central Sulawesi.

Often maintained in genus *Pachycephala*, but colour pattern unique within family; differs further in e.g. longer rictal bristles, nostril shape, shape of primaries and rectrices, and semi-decomposed ends of webs of rectrices. Monotypic.

**Distribution.** Mountains of Sulawesi.



**Descriptive notes.** 15 cm. Male has crown, hindneck and side of face sooty black, latter slightly tinged olive; mantle and rump dark chestnut-brown, upperwing-coverts black, upperwing mostly black, inner primaries and secondaries bordered slightly with light greenish-buff on inner webs. Rectrices white, with dark chestnut-brown; tail black; chin and upper throat sooty black, lower throat and breast dark brownish-olive, with buff yellow-olive wash below and cinnamon olive-green wash on flanks. Lower wing yellowish-olive, iris dark brownish-grey, bill black, legs dark grey. Female is brown above, crown lighter with greyish tinge.



uppertail-coverts also brown, remiges narrowly edged light ochraceous buff on outer webs, primaries and outer secondaries fuscous on inner webs; tail dark grey, rectrices edged brown on outer web (not extending to tip); buffy brown below, chin lighter, middle of belly washed yellow, undertail-coverts ochraceous brown. Immature = like female. Voice. Has typical whistler whistish call, loud and explosive, often given twice in rapid succession.

**Habitat.** Mountain forest, at 1500–2200 m.

**Food and Feeding.** Insects. Frequents understorey and lower middle storey. Captures prey by sallying and snatching.

**Breeding.** No information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sulawesi EBA. Fairly widespread but generally uncommon, although apparently quite common locally; rather skulking and secretive, and as a result little known. Occurs in Lore Lindu National Park, where reported as being rare.

**Bibliography.** Coates & Bishop (1997), Gibbs (1990a, 1990b), Riley (1918), Stresemann & Heinrich (1940b), Watling (1983), White & Bruce (1986).

## Genus *PACHYCEPHALA* Vigors, 1825

### 9. Olive Whistler

#### *Pachycephala olivacea*

**French:** Siffleur olivâtre **German:** Buchendickkopf **Spanish:** Silbador Oliváceo  
**Other common names:** Olivaceous Whistler, Olive Thickhead, Native Thrush, Whipbird

**Taxonomy.** *Pachycephala olivacea* Vigors and Horsfield, 1827, no locality = probably hinterland of Parramatta and Blue Mountains, east New South Wales, Australia.

Probably closest to *P. rufogularis* and *P. inornata*, and all three sometimes combined in subgenus *Timixos*; has been suggested that these three species represent one of the earlier lineages in the genus. Traditionally only two races, nominate and *macphersoniana*, recognized; more recent proposal to separate others is based on slight differences in size, plumage and sexual dimorphism that occur as stepped breaks coincident with geographical barriers. Five subspecies currently recognized.

**Subspecies and Distribution.**

*P. o. macphersoniana* H. L. White, 1920 – E Australia from extreme SE Queensland (Macpherson Range) S in mountains to E New South Wales (Barrington Tops).

*P. o. olivacea* Vigors & Horsfield, 1827 – mountains of SE New South Wales and C & NE Victoria.

*P. o. bathychoa* Schodde & Mason, 1999 – S Victoria (Otway and Strzelecki Ranges).

*P. o. hesperus* Schodde & Mason, 1999 – coasts of extreme SE South Australia and extreme SW Victoria.

*P. o. apatetes* Schodde & Mason, 1999 – islands in Bass Strait (King I, Flinders I) and Tasmania.



**Descriptive notes.** 17.5–21 cm, 35–41 g. Male nominate race has head and neck dark grey, forehead, lores, lower ear-coverts and malar area sometimes faintly mottled with white; upperparts dark olive-brown, rump and uppertail-coverts slightly paler, upwings dark brown, all feathers edged olive-brown, widest on tertials; tail dark olive-brown, feathers edged slightly paler; chin and throat white, finely mottled with dark grey, upper breast dark grey, grading into dark yellowish-brown on lower breast and anterior flanks, then into paler yellowish-brown on belly, posterior flanks and undertail-coverts; lower belly and crissum pale

buff to off-white; iris dark reddish-brown; bill black; legs dark grey. Female is slightly browner than male, but often not distinguishable. Juvenile is largely rufous-brown; immature has head and breast much browner, rufous-brown wing-coverts of juvenile retained, bill paler. Race *macphersoniana* is larger than nominate, with upperparts slightly brighter; *bathychoa* is smaller than nominate, male with upperparts more olive, underparts darker, female with upper breast browner; *apatetes* shows more pronounced sexual dimorphism, male is like previous, female has top of head and hindneck and ear-coverts dark greyish-brown, lores brown, upper breast lighter brown; *hesperus* is smaller than nominate, plumage similar but upperparts slightly paler. Voice. Song loud, audible to 135 m, varies geographically, with characteristic song types in different areas. In N (race *macphersoniana*) 3 notes with 2 intervening, first: “we-e-chaw-et-tee”, also a drawn-out “pee-oo”, last note lower; in SE (nominate) nine distinct song groups identified, general form of songs transliterated as “tu-ww-e-chou”, “you’re cranky” or “wee-o pretty” with sharp finish; in Otway Ranges of S Victoria (*bathychoa*) individual repertoires averaged five song types, with three shared among all birds. Contact call a long whistle; other calls written as “too-wheet”, “wheet wheet ha-wheet ha-wheet” and “peerah peerah peerah”.

**Habitat.** In N of range, found in rainforest above 1000 m; usually cool temperate forest with southern beech (*Nothofagus*) or coachwood (*Caropetalum*), but occasionally warm temperate rainforest and wet eucalypt (*Eucalyptus*) forest. In S, occurs in rainforest, wet eucalypt forest, dense gallery vegetation on paperbark (*Melaleuca*) and tea-tree (*Leptospermum*) thickets, coastal heath, mountain shrubland, and densely vegetated patches in exotic pine (*Pinus*) forest; from coast up to c. 1800 m.

**Food and Feeding.** Arthropods, mainly insects; occasionally seeds, leaves, small fruits. Forages in low, dense vegetation and on ground; occasionally ascends to middle storey. Gleans prey in foliage and from bark.

**Breeding.** Eggs Sept to early Jan, with no apparent geographical differences recorded; single brooded, but if clutch lost with up to four replacements. Breeds as simple pair; territorial. Nest built by both sexes, a deep cup of twigs, bark strips, leaves, pieces of palm fronds and rootlets, lined with grass. Galleys, occasionally leaves, external diameter 10–21.2–7 cm, height 22–25.4 cm, internal diameter 7–8.3 cm, depth 4–4.5 cm, placed 0.9–2 m (mean 1.4 m) above ground in bark or vine angle in dense vegetation. Clutch 2–3 eggs, buffy white to creamy buff, spotted with brown, with underlying blotches of leaden grey, often forming wreath at larger end, both sexes incubate eggs and feed chicks; no information on duration of incubation and nesting periods; fledglings fed by both parents. Maximum recorded longevity 5 years 8 months.

**Movements.** Largely sedentary; local movements reported, including altitudinal shifts from higher elevations in winter, particularly in S of range. All recoveries of marked individuals less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Scarce to uncommon and patchy in N; fairly common in S. Race *hesperus* regarded as “Near-threatened” in Australia because about half of its habitat has been cleared for agriculture, softwood plantations and townships; much of this activity has ceased, but some subpopulations are isolated. Much of habitat of N populations now protected, as are substantial areas where S races occur. Will return to forests c. 2 years after cessation of logging, but more often not until more than 10 years.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Chisholm (1921), Higgins & Peter (2002), Jackson (1921), Litter (1910), Marshall (1935), Mathews (1920e), Mayr (1954), Morgan (1971), North (1906), Schodde & Mason (1999), White, F.W.G. (1985, 1986, 1987a, 1987b), White, H.L. (1921a, 1921b).

### 10. Red-lored Whistler

#### *Pachycephala rufogularis*

**French:** Siffleur à face rousse **German:** Rotzängel-Dickkopf **Spanish:** Silbador Gorjirrufo  
**Other common names:** Red-throated/Buff-breasted Whistler, Red-lored Thickhead

**Taxonomy.** *Pachycephala rufogularis* Gould, 1841, Adelaide, South Australia, Australia. Probably closest to *P. olivacea* and *P. inornata*, and all three sometimes combined in subgenus *Timixos*; has been suggested that these three species represent one of the earlier lineages in the genus. Monotypic.

**Distribution.** SE South Australia (including NE Eyre Peninsula), NW Victoria and SW & C New South Wales.



**Descriptive notes.** 19–22 cm; 30–38 g. Male has lores, malar region, small area below eye, chin and throat rufous-orange, forming facial patch; rest of head and upperparts, including upwings and tail, dark brownish-grey, all wing feathers edged light brownish-grey; upper breast and flanks brownish-grey, lower breast to undertail-coverts light rufous-orange; iris dark red; bill and legs black. Female is often like male, but some are duller, the duller individuals lacking most of rufous-orange on face and underparts. Juvenile is brown, with supercilium rufous-brown, upperparts rufous-tinted greyish-brown, remiges, wing-coverts and rectrices suffused with rufous, underparts streaked; first immature as adult but duller, lacks rufous-orange on face and underparts, retains juvenile remiges, wing-coverts and rectrices; second immature as first immature, but with adult wing and tail. Voice. Song a loud, clear whistle quickly followed by note sounding like intake of breath through closed lips, “see-saw”, slow but swelling, sometimes with added rising final note, “see-saw-sik”. Also single drawn-out whistle and harsh “chut chut”.

**Habitat.** Low mallee (multi-stemmed eucalypt) woodland with open canopy and moderately dense but patchy understorey, usually with broombush (*Melaleuca uncinata*) and spinifex (*Triodia*); age of vegetation at least 5 years post-disturbance.

**Food and Feeding.** Arthropods, mainly insects; some seeds and fruit. Forages mainly on or near ground; in studies, 58% of foraging below 0.5 m, 14% at 0.5–1 m, 22% at 1–1.5 m, 6% at 1.5–2 m. Feeds mainly by gleaning, occasionally by sallying. Most prey taken on ground (44%), less often in low vegetation in foliage (33.3%), branches (11.1%) and bark of trunks (2.2%); 8.9% of food captured in air.

**Breeding.** Eggs Sept–Oct, occasionally Aug. Territorial, probably for most of year. Courtship involves rapid chases. Nest built by both sexes, a substantial cup of sticks, bark and mallee leaves, lined with grass and bark, internal diameter 7–8 cm, depth 5–5.4 cm; placed 0.5–1.75 m from ground in horizontal or vertical fork of shrub or tree, on top of clump of spinifex or under shrub or low tree. Clutch 2 eggs, sometimes 3, whitish to pale cream with amber-brown spots overlying indistinct grey and lavender markings, mainly at larger end, 24–25 × 17–18 mm; suggestion that both sexes incubate eggs and brood and feed nestlings requires confirmation; incubation period reportedly 15 days, nestling period unknown; fledglings fed by both parents. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*).

**Movements.** Mostly sedentary; some movements, extent and nature of which not known, but appear to occur mainly after breeding.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in South-east Australia EBA. At least half of this species’ habitat has been cleared, and process is continuing. Population may number fewer than 10,000 mature individuals. Listed as “Endangered” in New South Wales. Most major stands of vegetation are now protected in reserves, as e.g. in Murray-Sunset National Park, in NW Victoria. Such areas particularly susceptible to fire, with extensive areas lost at times; recolonization does not occur until at least 5 years after burning. Harvesting of broombush, if undertaken outside breeding period, may be beneficial in reducing vegetation to more optimal height. At some sites, this species has been replaced by related *P. inornata*.

**Bibliography.** Anon. (2006m), Barrett *et al.* (2003), Boles (1988), Butchart & Stattersfield (2004), Campbell (1901), Chandler (1913), Chisholm (1936, 1946), Eckert (1972), Hatch (1977), Higgins & Peter (2002), Keast (1961), Mathews (1920e), Mathew, Carpenter & Croft (1996), Mathew, Croft & Carpenter (1995), Mayr (1954), Parker (1984a), Parsons & McGilp (1935), Rix (1940), Schodde (1965b), Schodde & Mason (1999), Sluiter & O’Neill (1996), Stattersfield & Capper (2000), White (1912), Whitlock (1922), Woinarski (1987).

### 11. Gilbert’s Whistler

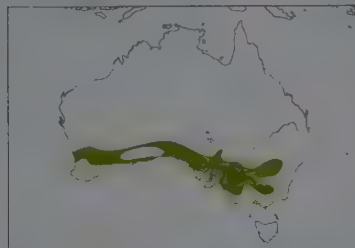
#### *Pachycephala inornata*

**French:** Siffleur de Gilbert **German:** Schwarzzängel-Dickkopf **Spanish:** Silbador de Gilbert  
**Other common names:** Black-lored/Red-throated Whistler, Red-throated Thickhead

**Taxonomy.** *Pachycephala inornata* Gould, 1841, “belts of the Murray”, South Australia, Australia.

Probably closest to *P. olivacea* and *P. rufogularis*, and all three sometimes combined in subgenus *Timixos*; has been suggested that these three species represent one of the earlier lineages in the genus. Plumage varies slightly, lower underparts rich ochraceous buff in W and becoming colder and greyish-white towards E, but individual variation also evident; birds from lightly timbered and

mallee areas of SW Australia (E at least to Nullarbor Plain) described as a geographical race, *gilberti*, but considered to represent part of cline. Monotypic.  
**Distribution.** Mallee tracts of SW Western Australia (except corner) E to NW & N Victoria and C New South Wales.



**Descriptive notes.** 17–20.5 cm; 28–36 g. Male has crown and sides of head and neck dark grey, lores through area below orbit black; mantle, back and scapulars dark brownish-grey, rump and uppertail-coverts grey; remiges dark brown, edged light olive-grey on outer webs, wing-coverts dark brownish-grey, secondary and median coverts edged pale olive-grey; tail grey; chin and throat orange-rufous, breast and flanks brownish-grey, belly and crissum pinkish-buff to off-white with pale brown wash, undertail-coverts cream; iris dark red; bill black; legs grey-black to black. Female differs from male in having lores paler

grey, chin and throat grey, underparts sometimes streaked pale grey. Juvenile has upperparts and wings dark brown, underparts off-white and heavily streaked dark brown; first immature like adult female, but retains juvenile remiges and wing-coverts, bill paler; second immature male like adult female. **Voice.** Varied repertoire; voice audible up to 900 m. Probable territorial vocalizations are 5–20 single “chop” or “chook” notes rapidly repeated, and series of 2–10 “er-whit”. Calls include harsh “aw-whit”, “e-chung”, harsh “ee-rath ee-rath”; also other, melodious notes.

**Habitat.** Inhabits semi-arid woodland and shrublands, particularly mallee, and mulga and other acacia (*Acacia*) habitats; also *Melaleuca* thickets, occasionally taller eucalypt (*Eucalyptus*) woodlands.

**Food and Feeding.** Arthropods, mainly insects; also fruits and seeds. Foraging heights in one study below 0.5 m (20%), 1–1.5 m (24%), 1.5–2 m (24%), 2–3 m (18%), 3–5 m (14%); in another, 20–66% of foraging on ground, 52–66% on branches, 26–5% in foliage. Prey captured mainly by gleaning.

**Breeding.** Eggs late Jul to late Dec. Territorial. Courtship chases of female by male followed by offer of nest material. Nest a deep cup of dry grass, fine twigs and bark strips, bound with spider web, lined with fine grass, wool and plant fibres, external diameter 10.8–12.7 cm, height 6.4–10.2 cm, internal diameter 5.7–7.3 cm, depth 3.8–6.4 cm; placed 0.4–6 m (mean 1.76 m) from ground in upright fork among foliage of small tree or shrub. Clutch 2–3 eggs, occasionally 4, dull white or pale yellow-buff, with brown, grey and olive spots and blotches concentrated at larger end, 21.3–24.1 × 16.8–18.5 mm; incubation by both sexes, period c. 15 days, no information on nestling period; distraction display performed, both adults moving quietly through branches with wings and tail spread. Hatching success c. 33%. Maximum recorded longevity more than 10 years 11 months.

**Movements.** Present throughout year in some areas, but appears intermittently in others, mainly in non-breeding season; extent and nature of movements not known. Considered nomadic or dispersive in places; known to shift during drought and after bush fires. All recoveries of marked birds less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Uncommon generally; scarcer in W of range. Has declined in areas owing to loss or fragmentation of habitat. Listed as “Vulnerable” in New South Wales.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Bourke (1954), Campbell (1901), Carter (1924a), Chandler (1941), Chisholm (1916, 1936, 1949), Ford (1971b, 1971c), Galbraith (1974b), Higgins & Peter (2002), Johnstone & Storr (2004), Joseph & Kernot (1982), Keast (1961), Mathews (1920e), Mayr (1954), North (1906), Parsons & McIlip (1935), Schodde & Mason (1999), Serventy & Whittell (1976), White (1913).

## 12. Rusty Whistler

### *Pachycephala hyperythra*

**French:** Siffleur rouilleux **German:** Rostbauch-Dickkopf **Spanish:** Silbador Herrumbroso  
**Other common names:** Rufous-breasted/Rusty-breasted/Brownish Whistler, Red-bellied Robin-whistler

**Taxonomy.** *Pachycephala hyperythra* Salvadori, 1876, Arfak Mountains, New Guinea. Possibly close to *P. olivacea*, *P. rufogularis* and *P. inornata*. Racial identity of population in EC New Guinea (headwaters of R Fly) uncertain; possibly an E extension of nominate, with which tentatively included. Four subspecies currently recognized.

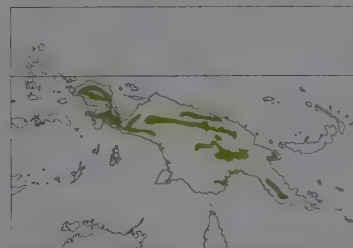
#### Subspecies and Distribution.

*P. h. hyperythra* Salvadori, 1876 – mountains of NW & W New Guinea (Vogelkop, Onin Peninsula, Wandammen Mts, Weyland Mts); also EC New Guinea (headwaters of R Fly, including upper R Palmer and Ok Tedi areas).

*P. h. sepikiana* Stresemann, 1921 – Sepik Mts, mountains S of R Mamberano and North Coastal Range, in N New Guinea.

*P. h. reichenowi* Rothschild & E. J. O. Hartert, 1911 – Huon Peninsula (Saruwaged Mts), in NE New Guinea.

*P. h. salvadorii* Rothschild, 1897 – mountains of SE New Guinea (E from L Kutubu and Mt Bosavi).



**Descriptive notes.** 15 cm; 25–29 g. Forehead, lores and crown are dark slaty grey, feathers below orbit blackish, ear-coverts dusky brown; upperparts warm olive-brown, upperwing dusky, outer edges of remiges more yellowish-olive, wing-coverts warm olive-brown; tail olive-brown, rectrices edged yellowish-olive on outer webs; chin, throat and malar region white, underparts light rufous; iris dark brown; bill black; legs pink to pinkish-grey or flesh-brown. Sexes alike. Juvenile is largely rufous on body, with remiges and wing-coverts edged rufous; immature similar to adult but retains juvenile remiges and coverts. Race *sepikiana* has upperparts more

olive, white throat patch larger, breast and belly brighter; *reichenowi* is similar to previous, but back darker and browner, underparts duller; *salvadorii* is like nominate, but back browner, underparts paler and duller. **Voice.** Song of 1–12 clear bell-like whistles increasing in loudness, terminating with 1–3 loud “whik!” downslurs or upslurs. Call a muted, rather mournful 2-note whistle, “too!” or “tu-ee”.

**Habitat.** Forest, mainly at 400–1200 m, occasionally in lowlands (foothills); locally to 1400 m. Replaced, with considerable overlap, by *P. simplex* in lowlands and by *P. soror* at higher elevations.

**Food and Feeding.** Insects. Prey captured by gleaning in undergrowth (c. 30%) and lower storey (c. 70%), mainly on the trunk and branches in inner two-thirds of trees.

**Breeding.** Nests with eggs in Nov. Nest a large cup, made mainly from small-leaved ferns, with some tendrils and moss, lined with pieces of leaves and rootlets. Clutch 2 eggs, purplish-buff to pinkish-buff, with grey and brown blotches and spots forming broad wreath near larger end, 22.3–24.2 × 16.9–17.9 mm. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common; otherwise scarce. Seems to be absent from many areas of apparently suitable habitat.

**Bibliography.** Coates (1990), Croxall (1977), Friih (1971a), Hartert (1930), Iredale (1956), Rand (1942a), Rand & Gilliard (1967), Rothschild & Hartert (1903a), Salvadori (1876a, 1881), Schodde & Hitchcock (1968)





### 13. Brown-backed Whistler

#### *Pachycephala modesta*

**French:** Siffleur modeste **German:** Braunrücken-Dickkopf **Spanish:** Silbador Modesto  
**Other common names:** Grey Mountain Pachycephala

**Taxonomy.** *Poecilodryas modesta* De Vis, 1894, Mount Maneau, 5000 feet [c. 1525 m], south-east New Guinea.

Relationships within genus uncertain. Three subspecies recognized.

#### **Subspecies and Distribution.**

*P. m. telefolminensis* Gilliard & LeCroy, 1961 – Victor Emanuel Mts and Hindenburg Mts, in EC New Guinea.

*P. m. hypoleuca* Reichenow, 1915 – mountains in provinces of Western, Southern and Eastern Highlands, Schrader Range, and Huon Peninsula (Saruwaged Mts), in E New Guinea.

*P. m. modesta* (De Vis, 1894) – Herzog Mts and mountains of SE New Guinea.



**Descriptive notes.** 14 cm; 19–21 g. Crown is dark grey, upper side of face to below orbit grey, ear-coverts brown, upperparts sooty brown with olive wash; upperwing and tail slaty brown, all wing feathers edged light grey; throat and underparts white, breast and flanks tinged grey; iris dark brown or dark red-brown; bill and legs black. Sexes alike. Juvenile is mottled heavily with chestnut-brown to dark red-brown; immature has upperparts olive-green, secondaries edged rufous, underparts buffy, upper breast sometimes with indistinct rufous band, belly washed pale yellow. Race *hypoleuca* differs from nominate in having

upperparts less olive, more greyish-brown, underparts darker grey; *telefolminensis* resembles previous, but darker above and below. **Voice.** Song of rising “wheet” whistles, first 4 successively lower in pitch, subsequent notes alternating in pitch, terminating with 1–2 loud downslurs, “chew”.

**Habitat.** Forest, ecologically disturbed areas, occasionally small trees in alpine grassland. Mainly from 1830 m to timber-line (3350–3600 m); locally as low as 1130 m in SE of range (Efogi).

**Food and Feeding.** Insects, occasionally fruits. Frequents canopy (70–85% of observations) and middle storey. Captures prey by gleaning from large and small branches, twigs and outer foliage; very occasionally by sallying.

**Breeding.** Female with well-developed egg in early Sept. and breeding birds in late Nov and early Dec, indicative of breeding during latter part of dry season to early wet season, at least. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common; otherwise scarce.

**Bibliography.** Coates (1990), Croxall (1977), Diamond (1972), Gilliard & LeCroy (1961a, 1968), Greenway (1935), Gyslenstolpe (1955a), Mack & Igag (1998), Mayr (1931b), Rand & Gilliard (1967).

### 14. Mangrove Whistler

#### *Pachycephala cinerea*

**French:** Siffleur cendré **German:** Schnäpperdickkopf **Spanish:** Silbador de Manglar  
**Other common names:** Grey Thickhead, Grey Mangrove Flycatcher-Shrike; Philippine/Palawan Whistler (*plateni*)

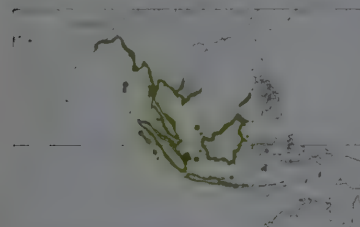
**Taxonomy.** *Muscitrea cinerea* Blyth, 1847, Island of Ramree, Arakan, west Myanmar.

In recent decades this species has sometimes been referred to as *P. grisola*, but type of *grisola* apparently lost, making the name effectively unidentifiable (see page 375). Forms a superspecies with *P. albiventris*, *P. homeyeri* and *P. phaenota*; often treated as conspecific with first two, but differs from both in plumage. Race *plateni* sometimes accorded full species rank. Proposed races *vandepolli* (S Vietnam, Cambodia, E coasts of Malay Peninsula, Riau Archipelago, islands off W Sumatra), *butaloides* (Bangka, Belitung, S Borneo, Java, Kangean Is. Bali, Lombok) and *secedens* (N Borneo, Maratua I., Natuna Is., Karimata Is.) not regarded as separable, and all merged with nominate. Two subspecies recognized.

#### **Subspecies and Distribution.**

*P. c. cinerea* (Blyth, 1847) – coasts from NE India (Bay of Bengal) E, including Andaman Is., Mergui Archipelago (W Myanmar) and Langkawi I. (W Malaysia), to S Vietnam (S Annam), extending inland in Cambodia (Tonal Sap area) and SW Laos, also Riau Archipelago, Sumatra and satellites (Simeulue, Nias, Batu Is., Siberut, South Pagai, Bangka, Belitung), Borneo (including Maratua I.), Natuna Is., Karimata I., Java, Kangean Is., Bali and Lombok.

*P. c. plateni* (A. W. H. Blasius, 1888) – Palawan, in W Philippines.



**Descriptive notes.** 17 cm; 19–25 g. Nominant race has forehead light grey, top and side of head dull ashy brown, lores light grey; upperparts ashy grey, remiges and upperwing-coverts greyish-umber, tail umber; white below, throat and cheek faintly mottled with brown, upper breast slightly washed umber, feathers of thighs brown basally and white distally; iris brown; bill black; legs dark slate. Sexes alike. Juvenile has upperparts warm rusty brown, secondaries and wing-coverts edged rusty brown, underparts white, bill pinkish brown; immature as adult, but retains juvenile secondaries and wing-coverts. Race

*plateni* has upperparts uniformly greyish-brown, throat greyish-white, breast grey, belly and undertail-coverts white. **Voice.** Song has general pattern of series of loud, musical notes with 1–2 louder concluding ones. In India emits loud, clear whistle, repeated 3–4 times on rising scale, or prolonged and drawn out, followed by higher or lower note; in SE Asia variable phrases starting with 2–4 short notes and often finishing with louder, more explosive one, as “tit tit phew-whiu-whi”, “chi chi chi wit-phew-chew” or “tit tit tit too-whit”; in Malay Peninsula 8–9 whistles on same pitch, slightly accelerating and increasing in volume, with final double note; on Palawan (race *plateni*) a whistled “peee purr chiaoonkk” or “peeee purr purr chiaoonkk”, last note ending loudly.

**Habitat.** Mangroves and adjacent coastal vegetation, including casuarina (*Casuarina*) forest, locally plantations and wooded gardens, island forest, riverine vegetation; usually near coast, rarely farther inland, occasionally to higher altitudes, up to 1830 m in parts of Wallacea. On Palawan, race *plateni* inhabits forest at all elevations.

**Food and Feeding.** Insects. Captures prey by sallying, and by gleaning and snatching from branches and trunks of trees. Joins mixed-species foraging flocks.

**Breeding.** Season Apr–Jul in India Mar–Jun in SE Asia, Apr in Java; on Palawan, birds with enlarged testes in May, variable, enlarged gonads late Mar to late Apr in some years but not in others. Nest a thin, flimsy cup attached by spider web to supporting twigs 1–4 m (occasionally as high as 15 m) above ground. Clutch 2 eggs, creamy buff to pale brown, with sepia to blackish-brown spots over lavender undermarkings usually forming zone at broader end, 20.9–25.4 × 15.7–17 mm. No other information.

**Movements.** Resident throughout range.

**Status and Conservation.** Not globally threatened. Widespread, but nowhere very numerous. Fairly common in India and Andaman Is.; uncommon to locally common in SE Asia, scarce in Singapore. Moderately common in Wallacea.

**Bibliography.** Ali & Ripley (1972), Chasen (1939), Chasen & Kloss (1930), Delacour & Jabouille (1931a), Dickinson *et al.* (1991), Goodman & Gonzales (1990), Hellebrekers & Hoogerwerf (1966), Hoogerwerf (1949, 1950a, 1950b), van Marle & Voous (1988), Mukherjee (1970), Parkes (1989), Rasmussen & Anderton (2005), Ripley & Rahor (1958), Robson (2000), Smythies (1981), Walters (2003), White & Bruce (1986).

### 15. Green-backed Whistler

#### *Pachycephala albiventris*

**French:** Siffleur à dos vert **German:** Olivrücken-Dickkopf **Spanish:** Silbador Dorsiverde

**Taxonomy.** *Hyloterpe albiventris* Ogilvie-Grant, 1894, the mountains of northern Luzon, Philippines.

Forms a superspecies with *P. cinerea*, *P. homeyeri* and *P. phaenota*; often treated as conspecific with first two, but differs in plumage. Three subspecies recognized.

#### **Subspecies and Distribution.**

*P. a. albiventris* (Ogilvie-Grant, 1894) – N Luzon (Cordillera Mts, Sierra Madre), in N Philippine Islands.

*P. a. crissalis* (J. T. Zimmer, 1918) – C & S Luzon (Zambales Mts, Mt Banahao, Mt Isarog, Mt Mayon).

*P. a. mindorensis* (Bourne & Worcester, 1894) – Mindoro.



**Descriptive notes.** 16 cm; 18–25 g. Nominant race has crown and mantle dull olive-green, shading into bright olive-yellow on rump and uppertail-coverts; side of head and ear-coverts olive-grey; remiges brownish-black, edged olive-yellow on outer web; tail olive-yellow, rectrices edged brighter on outer webs; chin and throat whitish-grey with faint streaks becoming pale brownish-grey on breast, sides darker and slightly washed olive, belly white, *crissalis* and *mindorensis* washed yellowish; iris dark brown; bill black; legs greyish-purple. Sexes alike. Juvenile is dark brown above, inner secondaries and wing-coverts washed yellowish.

**Habitat.** Forest: from lowlands to high mountains, to 2000 m.

**Food and Feeding.** Insects. Forages from understorey up to canopy. Joins mixed-species foraging flocks.

**Breeding.** Season variable, birds in breeding condition in Feb–May in some years but not in others; fledglings seen in Mar. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Mindoro EBA, and Luzon EBA. Reported to be common to abundant at some localities; often more numerous above 1000 m.

**Bibliography.** Dickinson *et al.* (1991), Goodman & Gonzales (1990), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1894, 1895), Parkes (1989), Whitehead (1899).

### 16. White-vented Whistler

#### *Pachycephala homeyeri*

**French:** Siffleur de Blasius **German:** Braunbrust-Dickkopf **Spanish:** Silbador Culiblanco

**Taxonomy.** *Hyloterpe Homeyeri* A. W. H. Blasius, 1890, Jolo, Sulu Archipelago.

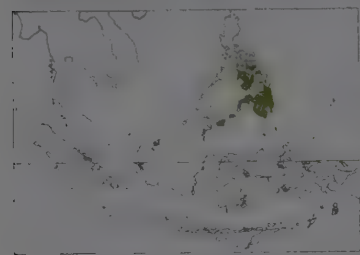
Forms a superspecies with *P. cinerea*, *P. albiventris* and *P. phaenota*; often treated as conspecific with first two, but differs in plumage. Three subspecies recognized.

On following pages: 17. Island Whistler (*Pachycephala phainonota*); 18. Grey Whistler (*Pachycephala simplex*); 19. Yellow-bellied Whistler (*Pachycephala pinnipennis*); 20. Sulphur-bellied Whistler (*Pachycephala sulfuriventer*); 21. Bornean Whistler (*Pachycephala hypoxantha*); 22. Fawn-breasted Whistler (*Pachycephala orpheus*); 23. Bare-throated Whistler (*Pachycephala nudigula*); 24. Vogelkop Whistler (*Pachycephala meyeri*); 25. Selater's Whistler (*Pachycephala soror*); 26. Lorentz's Whistler (*Pachycephala lorentzi*); 27. Regent Whistler (*Pachycephala schlegelii*); 28. Hooded Whistler (*Pachycephala implicata*).



**Subspecies and Distribution.**

*P. h. winchelli* (Bourne & Worcester, 1894) – WC Philippines (Tablas, Sibuyan, Masbate, Ticao, Panay, Cebu, Negros, Pan de Azúcar, Negros).  
*P. h. major* (Bourne & Worcester, 1894) – Cebu (SC Philippines).  
*P. h. homeyeri* (A. W. H. Blasius, 1890) – Mindanao and Sulu Is (Jolo, Tawi-Tawi, Sanga Sanga, Bongao, Sipangkot, Sibutu, Simunul), in S & SW Philippines; also Siamil I, off NE Borneo.



**Descriptive notes.** 16–17 cm. Nominative race is rufous-brown above, top and side of head slightly darker, ear-coverts vinaceous cinnamon; remiges edged reddish-brown on outer webs; tail reddish-brown, particularly on outer edges of rectrices; chin, throat and upper breast white, washed with cinnamon, lower breast and belly white, breast side and flanks cinnamon, crissum white; iris reddish-brown to dark brown; bill black; legs grey. Sexes alike. Juvenile has strong rufous edgings on rectrices and wing-coverts. Race *major* is like nominate but larger; *winchelli* has underparts duller, sides of throat with cinnamon wash reduced

or absent. Voice. Varied series of whistles, e.g. “oo-wichee-wi”, “yump”, “yump wit”, “hu wee-i hu” or “u-wichee-u-woo”, emphasis usually on penultimate note (nominate race); high-pitched, upslurred “wheet” and 2 short, sharp notes followed by 2–3 notes, “per-wit che-wi-wi” or “per-wit chi-vi”.

**Habitat.** Forest, from sea-level to above 2000 m.

**Food and Feeding.** Insects. Occurs at all levels in forest; almost always in understorey on Siamil I (NE Borneo). Joins mixed-species feeding flocks.

**Breeding.** Breeding recorded in Sept; birds with enlarged gonads in Jan–May and with slightly enlarged gonads in Oct. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. The most common passerine on Siamil I (NE Borneo). On Tablas (Philippines) frequent in native forest, including isolated patches of remnant forest.

**Bibliography.** Blasius (1890a), Dickinson *et al.* (1991), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant (1896a), Parkes (1989), Thompson (1966).

## 17. Island Whistler

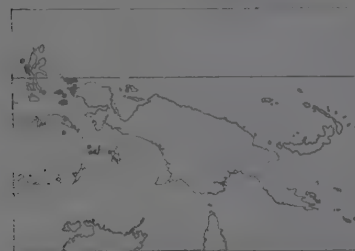
*Pachycephala phaionota*

**French:** Siffleur des Moluques **German:** Küstendickkopf **Spanish:** Silbador Moluqueño  
**Other common names:** Island Robin-whistler

**Taxonomy.** *Myiolestes phaionotus* Bonaparte, 1850, Banda Islands.

Forms a superspecies with *P. cinerea*, *P. albiventris* and *P. homeyeri*. Proposed race *stresemanni*, from Mayu I (between NE Sulawesi and Halmahera), considered indistinguishable from populations in rest of range. Monotypic.

**Distribution.** Small islands from Moluccas E to W New Guinea and S Banda Sea: Mayu, islands off W & S Halmahera (Ternate, Tidore, Mare, Moti, Damar), West Papuan Is (Waigeco, Sorong, Salawati, Kofiau, Misool, Schildpad) and Geelvink Bay (Rani); NE Seram (Bula), Seram Laut and Banda Is (Bandaneira); Tayandu (Kur, Manggur, Taam) and Kai Is (Kai Kecil and smaller islands); Aru Is (Pulau Babi and smaller islands).



**Descriptive notes.** 16 cm. Crown and side of head are greyish-brown, grading to brown on hindneck, lores washed darker grey, ear-coverts brown; upperparts brown, upperwing dusky brown, primaries and outer secondaries edged lighter brown on outer webs, inner secondaries and tertiaries almost entirely brown; tail brown; chin and throat white; underparts dull white with greyish-ochre wash (mainly on breast and flanks), centre of belly and undertail-coverts paler; iris brown; bill black; legs pinkish-buff. Sexes alike. Immature has top and side of head olive-brown. Voice. Loud “weet-chuw-weeééé”, also “chup” notes and more nasal notes.

**Habitat.** Coastal vegetation, beach scrub and secondary scrub, and mangroves; occasionally nutmeg and clove plantations. Sea-level to 550 m.

**Food and Feeding.** Insects. Frequents shady understorey.

**Breeding.** Nest found in late Aug and nesting pair seen in early Sept on Seram; nest with eggs in late Sept on Bandaneira. Nest a small woven cup, placed c. 2 m from ground in casuarina (*Casuarina*). Further eggs. No other information available.

**Movements.** Sedentary.

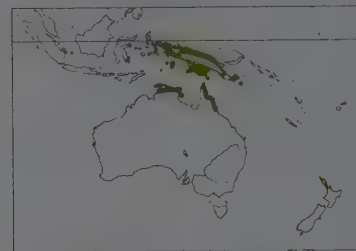
**Status and Conservation.** Not globally threatened. Restricted-range species: present in Banda Sea Islands EBA, Northern Maluku EBA, West Papuan Lowlands EBA, Geelvink Islands EBA and Aru Islands EBA. Secondary Area. Uncommon to moderately common.

**Bibliography.** Coates & Bishop (1997), David & Gosse (2002a), Ekstrom & Isherwood (2000), Hartert (1903b), Iredale (1956), Johnstone & Sudaryanto (1995), Mees (1965), Rand & Gilliard (1967), Salvadori (1881), White & Brown (1966).

Further research warranted. Name “*P. rufipennis*” was based on immature of present species. Eleven subspecies recognized.

**Subspecies and Distribution.**

*P. s. waigeuensis* Stresemann & Paludan, 1932 – N West Papuan Is (Gebe, Waigeco).  
*P. s. gagiensis* Mayr, 1940 – Gagi I (SW of Waigeco).  
*P. s. griseiceps* G. R. Gray, 1858 – West Papuan Is (Salawati, Batanta, Misool), NW New Guinea (Vogelkop E to head of Geelvink Bay) and Aru Is.  
*P. s. miosnomensis* Salvadori, 1879 – Meos Num (in Geelvink Bay).  
*P. s. jobiensis* A. B. Meyer, 1874 – N New Guinea from Yapen Is and E coast of Geelvink Bay E to Astrolabe Bay.  
*P. s. rufipennis* G. R. Gray, 1858 – Kai Is.  
*P. s. perneglecta* E. J. O. Hartert, 1930 – S New Guinea from foot of Weyland Mts (S from R Mimika) E, including Daru I, to Galley Reach.  
*P. s. dubia* E. P. Ramsay, 1879 – SE New Guinea E from Huon Peninsula and, in S, from Sogeri District and R Laloki, and D’Entrecasteaux Archipelago (Goodenough I, Fergusson I, Normanby I).  
*P. s. sudestensis* (De Vis, 1892) – Louisiade Archipelago (Tagula I), E of D’Entrecasteaux. (New Guinea).  
*P. s. simplex* Gould, 1843 – N Northern Territory (Port Keats E to Port Bradshaw, including Melville I and Groote Eylandt), in N Australia.  
*P. s. peninsulae* E. J. O. Hartert, 1899 – NE Queensland (Cape York Peninsula S to Cairns district), in NE Australia.



**Descriptive notes.** 14–15 cm; 16–20 g (Australia), 20–24 g (New Guinea). Nominative race has off-white supercilium from side of forehead to above eye and broken eyering, greyish-brown lores and ear-coverts; neck side and upperparts olive-brown, upperwing grey-brown, primaries and greater primary coverts edged pale brown; tail dark olive-brown, rectrices edged paler; off-white below, chin and throat faintly streaked light brown, breast washed with brown, sometimes with darker streaking; iris reddish-brown; bill and legs black. Sexes alike. Juvenile is rufous, underparts paler and lighter, remiges, rectrices and

primary coverts edged rufous, secondary coverts rufous; immature like adult, but retains juvenile remiges and primary coverts, has paler bill. Races differ mainly in plumage tones, amount of yellow in plumage (present in all except first of following), and degree of streaking below: *dubia* is like nominate (i.e. lacks yellow pigment), but upperparts deeper brown, throat more heavily streaked, breast and flanks washed rufous-brown; *waigeuensis* has back olive, streaks on throat faint, breast without brown wash, belly pale yellow; *gagiensis* is like previous but slightly larger; *jobiensis* is also similar, but belly brighter yellow; *griseiceps* is also similar but breast has brownish wash, ear-coverts browner; *perneglecta* is like previous but with heavier streaking on throat; *sudestensis* is same as last in plumage, but larger and with longer bill; *peninsulae* is similar to previous two, but upperparts not so deeply coloured, throat less heavily streaked, wash on breast reduced; *rufipennis* is like *griseiceps* but back less olive, belly whiter; *miosnomensis* is larger, with wing longer. Voice. Song (nominate race) a slow series of notes, “eee-wee-wee-weekyoo”, sometimes with concluding whistler note; of *peninsulae*, 5–10 clear whistled notes, also transliterated as “one-two-three-four-five” or “catch-a-fish-alive”; of *dubia*, 2–5 not particularly melodious notes, followed by louder, mildly explosive, downslurred “chew”, given 1–5 times; of *perneglecta*, several loud, liquid, melodious notes in repeated pattern of downslur, “tew”, followed by longer upslur, “wheet”, increasing in volume, and with final upslur mildly explosive. Calls include 2–3 muted short whistled notes, each on different pitch, somewhat resembling first few notes of song (*dubia*); 2 short notes, second lower (*peninsulae*).

**Habitat.** In New Guinea inhabits rainforest, monsoon forest, tall secondary growth, forest edges, gallery forest and, locally, mangrove forest, partly cut forest, dense second growth; more numerous at forest edge; lowlands and hills to 1400 m, locally to 1550 m. In Australia tall rainforest, monsoon rainforest, drier vine forest, often on margins and regrowth, adjacent open forest, also mangroves (Northern Territory); lowlands, to 900 m on Atherton Tableland (NE Queensland).

**Food and Feeding.** Mainly insects, some spiders (Araneae); occasionally seeds. In Australia, forages mainly in middle to upper storey and canopy, occasionally below 1 m: in limited studies in NE Queensland, roughly a third of observations each in lower, middle and upper thirds of forest; in Northern Territory rainforest 20% of foraging at 2–3 m and 80% at 4–7 m, in mangroves 26–8% at 1–1.2 m, 41–5% at 2–1.4 m, 19–5% at 4–1.8 m and 4–1% above 8 m. In NE Queensland, shifts to higher levels of forest in wet season. Forages mainly in foliage (72–83%), remainder of time on branches (9–24%) and in vines (7–27%). Most prey captured by gleaning (55–86%) or flutter-gleaning (3–46%), sometimes sally-striking from leaf surface (7–28%), rarely in air. In New Guinea, prey captured by gleaning (58%) and snatching (27%), less often by hovering (11%) and sallying (4%); items taken mainly from leaves (56%) and branches (39%), occasionally from vines (2%) or in air (4%). Often joins mixed-species foraging flocks.

**Breeding.** In New Guinea, records suggest breeding peaks mainly at end of wet season and during second half of dry season, some also in early dry and early wet seasons; in Australia, breeds in Oct–Jan (possibly any month, depending on food) in NE Queensland and Dec–Mar in Northern Territory. Maintains loose territory throughout year. Nest a cup of grass, leaves, rootlets, twigs, plant fibre, sometimes spider web, lined with tendrils, feathers and grass seedheads, external diameter 7.6–10.2 cm, height 5.7–7.6 cm, internal diameter 5.1–6.4 cm, depth 3.2–5.1 cm; placed in fork of branch, foliage in vine or among upright shoots on stump, usually at 6–15 m (sometimes lower) in Australia, 2.7–12 m from ground in New Guinea. Clutch 2 eggs, pale buff with dark brown and lilac spots (nominate race) or white with brown and lavender spots mostly at larger end (*peninsulae*), 21.6–23.4 × 15.2–16.3 mm; no information on incubation and fledging periods.

**Movements.** Sedentary; all recoveries of marked individuals, in both New Guinea and Australia, less than 10 km from site of original ringing. Some of NE Queensland population may move to lower elevations in winter; possibly dry-season shift to dry vine thickets in Northern Territory.

**Status and Conservation.** Not globally threatened. Common at lower elevations in New Guinea; density at study site near R Brown (SE New Guinea) estimated at 20 birds/10 ha. Generally common in Australia; densities of 0.24–3.9 birds/ha at various localities in Northern Territory and Queensland.

**Bibliography.** Barrett *et al.* (2003), Bell (1982b, 1982c, 1983, 1984a), Boles (1988), Brooker, Braithwaite & Isherwood (1990), Campbell (1901, 1918), Campbell & Barnard (1917), Coates (1990), Coates (1978), Diamond (1972), Iredale (1983b), Galbraith (1974b), Greenway (1935), Hartert (1930), Higgins & Peter (2002), Hoogerwerf (1971), Iredale (1956), Innes & Sauer (2004), Le Souef (1962), Macgillivray (1914), Mainwaring (1920), Mayr (1954), Mayr & Rand (1937), Noske (1996), Peckover & Filewood (1976), Rothschild & Hartert (1903a), Salvadori (1881), Schodde & Hitchcock (1968), Schodde & Mason (1999).

## 18. Grey Whistler

*Pachycephala simplex*

**French:** Siffleur sobre **German:** Graudickkopf **Spanish:** Silbador Simple  
**Other common names:** Brown Whistler/Thickhead (*simplex* and *dubia*); Grey-headed Whistler (all other races); York Thickhead (*peninsulae*)

**Taxonomy.** *Pachycephala simplex* Gould, 1843, Port Essington, Northern Territory, Australia.

Races sometimes separated into two species, one with nominate race and *dubia* (both browner, and blacker, on upperparts), the other containing the nine remaining races (all grey, with some grey on underparts); such treatment possibly better: in E New Guinea, however, *dubia* hybridizes with *jobiensis* in N (near Astrolabe Bay) and with *perneglecta* in S (near R Laloki).



## 19. Yellow-bellied Whistler

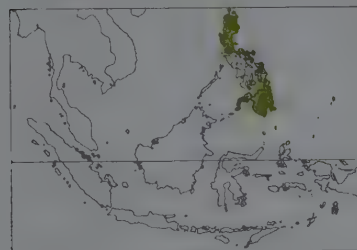
### *Pachycephala philippinensis*

French: Siffleur des Philippines German: Philippinendickkopf Spanish: Silbador Filipino

**Taxonomy.** *Hyloterpe philippinensis* Walden, 1872, Luzon, Philippines. Forms a superspecies with *P. sulfuriventer* and *P. hypoxantha*. Seven subspecies recognized.

#### Subspecies and Distribution.

*P. p. fallax* (McGregor, 1904) – Calayan, in N Philippines.  
*P. p. illex* (McGregor, 1907) – Camiguin Norte, in N Philippines.  
*P. p. philippinensis* (Walden, 1872) – Luzon and Catanduanes (N Philippines).  
*P. p. apoensis* (Mearns, 1905) – EC & S Philippines (Samar, Biliran, Leyte, Dinagat, most of Mindanao, Pujada).  
*P. p. baholensis* Parkes, 1966 – Bohol (SC Philippines).  
*P. p. siquijorensis* Rand & Rabor, 1957 – Siquijor (SC Philippines).  
*P. p. basilanica* (Mearns, 1909) – W Mindanao (Zamboanga Peninsula) and Basilan, in S Philippines.



**Descriptive notes.** 15–16 cm; 21–27 g. Nominate race has crown brownish-grey, slightly tinged olive, side of head and ear-coverts greyish-brown, upperparts olive-green; upperwing greyish, primaries edged greyish-olive, other remiges with olive-green edging on outer webs; tail olive-green; chin and throat off white with faint streaking, underparts dull yellow, upper breast washed greyish-olive, sides yellowish-olive; iris dark brown to reddish-brown; bill dark horn to black; legs greyish-pink. Sexes alike. Immature is similar to adult, but breast and belly rufous. Race *fallax* has crown browner than nominate, upperparts and flanks

darker; *illex* is larger, with breast and flanks yellower; *apoensis* has upperparts bright olive-green, bill smaller; *baholensis* is similar to previous, but has underparts paler yellow, outer webs of primaries edged grey over entire length; *siquijorensis* is also similar, but underparts somewhat paler, bill slightly larger; *basilanica* is like last, but crown brownish, upperparts paler, underparts brighter yellow. VOICE. Loud, rising, single-note whistle, “peeepup”, repeated for extended periods; also whistled “hu-i-yu wit weu”, last note drawn out.

**Habitat.** Forest, from sea-level to at least 1220 m.

**Food and Feeding.** Insects. Forages usually in understorey, but ranges up to canopy. Joins mixed-species feeding flocks.

**Breeding.** Nesting recorded in Feb and Jun, also adults with enlarged gonads in Jan–May, nestlings in Apr and nest and eggs in May. Nest an open cup of fine roots and leaves, placed at least 3 m up in understorey. Clutch 2 eggs, possibly 3, brownish-cream, spotted with light brown, blotched with bluish-grey, 23 × 17 mm. No other information.

**Movements.** Apparently sedentary.

**Status and Conservation.** Not globally threatened. Common, but decreasing in abundance; has declined locally in areas above 1000 m.

**Bibliography.** Dickinson *et al.* (1991), Goodman & Gonzales (1990), Jakosalem *et al.* (2002), Kennedy *et al.* (2000), McGregor (1909), Ogilvie-Grant & Whitehead (1898), Parkes (1966), duPont (1971), Rand & Rabor (1960), Whitehead (1899).

## 20. Sulphur-bellied Whistler

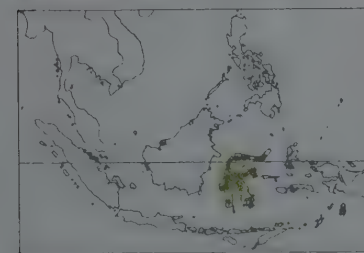
### *Pachycephala sulfuriventer*

French: Siffleur à ventre jaune German: Celebesdickkopf Spanish: Silbador Ventrisulfúreo  
Other common names: Sulphur-vented/Yellow-vented/Yellow-bellied(!) Whistler, Celebes/Luwesi (Mountain) Whistler

**Taxonomy.** *Hyloterpe sulfuriventer* Walden, 1872, Minahassa, north Sulawesi.

Forms a superspecies with *P. philippinensis* and *P. hypoxantha*. Proposed race *meridionalis* (from Mt Lompobattang, in S Sulawesi) slightly paler below than birds elsewhere in range, but regarded as insufficiently distinct to warrant recognition. Monotypic.

**Distribution.** N, C, SE & far S Sulawesi.



**Descriptive notes.** 14–15 cm; 22 g. Male is olive-brown tinged with olive above, crown darker, supraloral and orbital regions and ear-coverts paler, lower back and uppertail-coverts slightly more reddish; upperwing dark brown, remiges edged olive-brown, coverts largely olive-brown; tail olive-brown; chin, throat, breast and upper belly off-white, breast faintly washed pale brown, grading to yellow on centre of belly, becoming bright yellow on lower belly, undertail-coverts and thighs, tinged light yellow on flanks; iris dark brown; bill black; legs slate-grey. Female is like male, but has underparts paler. Immature has head

with reduced grey tinge, rufous tinge in plumage. VOICE. Song 5 whistled notes, decreasing in pitch while increasing in volume, concluding with loud note, “wiwiwiwiwhit”. Also long upslur preceding 3 short notes, “wheeu tu tu tu”.

**Habitat.** Primary forest, less often forest edge and secondary forest, from sea-level to 2500 m, mainly 800–2500 m (mostly absent below 800 m); 1000–2500 m on Mt Lompobattang.

**Food and Feeding.** Insects. Forages from near ground in understorey up to lower canopy, but mainly in middle storey. Forages along trunks and large branches. Joins mixed-species flocks.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Sulawesi EBA. Widespread and generally common. Adversely affected by habitat modification and clearance; density found to decrease in sequence from primary forests to secondary forests, to mixed rural habitat and to plantations. Present in Lore Lindu National Park.

**Bibliography.** Coates & Bishop (1997), Holmes & Wood (1980), Meyer & Wiglesworth (1898b), Sodhi, Koh *et al.* (2005), Stresemann & Heinrich (1940b), Walters *et al.* (2005), Watling (1983), White & Bruce (1986).

## 21. Bornean Whistler

### *Pachycephala hypoxantha*

French: Siffleur de Bornéo German: Borneodickkopf Spanish: Silbador de Borneo  
Other common names: Bornean Mountain Whistler

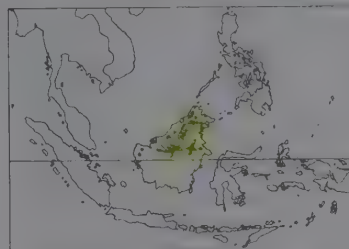
**Taxonomy.** *Hyloterpe hypoxantha* Sharpe, 1887, Kinabalu, Borneo.

Forms a superspecies with *P. philippinensis* and *P. sulfuriventer*. Two subspecies recognized.

#### Subspecies and Distribution.

*P. h. hypoxantha* (Sharpe, 1887) – mountains of N & C Borneo (from Mt Kinabalu S to Mueller Range; also Niut Range).

*P. h. sarawacensis* Chasen, 1935 – Poi Range (W Sarawak), in W Borneo.



**Descriptive notes.** 16 cm. Male nominate race has crown and upperparts dull olive-yellow, forehead and above orbit slightly brighter, rump tinged brighter yellow, uppertail-coverts yellowish-green; lores dark grey, side of face and ear-coverts olive-yellow; remiges dusky, edged yellowish-grey on outer webs, primaries ashy grey towards end, upperwing-coverts dusky, edged greenish; tail blackish, rectrices edged olive-green; lower part of face to throat and underparts bright yellow, lower throat, body side and flanks with dull olive wash, thighs and undertail-coverts yellow; iris dark brown; bill black; legs grey-brown. Female is

like male, but throat and breast more olive. Juvenile described as almost entirely rufous-brown, with some yellow on underparts. Race *sarawacensis* has underparts more uniformly yellow than nominate, with greenish wash reduced, particularly on breast side. VOICE. Song loud, with whipcrack finish.

**Habitat.** Montane forest at 900–2000 m; to 2600 m on Mt Kinabalu.

**Food and Feeding.** Insects, occasionally seeds. Forages in crowns of smaller trees and lower levels of tall trees. Captures prey by gleaning and sally-striking. Joins mixed-species flocks.

**Breeding.** Fledglings seen in Jun and early Nov. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Bornean Mountains EBA. Common in most of range; more plentiful at higher elevations. Occurs in Mount Kinabalu National Park.

**Bibliography.** Banks (1937b), Chasen (1935), Davison (1992), MacKinnon & Phillips (1993), Sharpe (1887), Smythies (1957, 1964), Smythies & Cranbrook (1981), Smythies & Davison (1999).

## 22. Fawn-breasted Whistler

### *Pachycephala orpheus*

French: Siffleur orphée German: Orpheusdickkopf Spanish: Silbador de Timor  
Other common names: Timor/Sunda Whistler

**Taxonomy.** *Pachycephala orpheus* Jardine, 1849, Timor.

A member of a species group that includes also *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. impunctata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Proposed race *wetterensis* (from Wetar) regarded as insufficiently differentiated from populations elsewhere in range to warrant recognition. Monotypic.

**Distribution.** Wetar and Timor (including Jaco and Semaui), in E Lesser Sundas.



**Descriptive notes.** 14 cm; 15–16 g. Forehead is whitish-grey, lores and supercilium dull whitish-grey, ear-coverts light reddish-brown; crown grey, upperparts greenish olive-brown, merging into dull yellow on rump and uppertail-coverts; upperwing brown, remiges edged pale olive-brown on outer webs, tail brown, washed with yellow; chin and throat white, breast light buffy fawn, belly and flanks paler, undertail-coverts yellow, thighs pale brown, becoming yellow distally; iris dark brown; bill black, lower mandible with varying amounts of pinkish-grey at base; legs leaden grey. Female is similar to male, but crown less contrasting.

Immature has some dark streaking on breast, bill paler. VOICE. Song 10–16 clear, monotonal whistles, beginning very softly, then increasing in speed and volume, notes running together towards end, ending in 2 loud notes. Also a slightly upslurred note followed by downslur, then end of main song.

**Habitat.** Monsoon forest, secondary growth, beach and hill scrub, locally mangroves; sea-level to 1200 m.

**Food and Feeding.** Insects. Forages in understorey and middle storey. Gleans; occasionally snatches items.

**Breeding.** Begging juvenile in mid-Jul and adult carrying food in Dec; extrapolated egg-laying dates Mar, Jun and Nov. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Timor and Wetar EBA. Moderately common to common.

**Bibliography.** Coates & Bishop (1997), Mayr (1944b), Meyer & Wiglesworth (1898b), Noske (2003c), White & Bruce (1986).

## 23. Bare-throated Whistler

### *Pachycephala nudigula*

French: Siffleur à gorge nue German: Nacktkehl-Dickkopf Spanish: Silbador de Flores  
Other common names: Lesser Sunda Whistler

**Taxonomy.** *Pachycephala nudigula* E. J. O. Hartert, 1897, south Flores, Lesser Sundas.



A member of a species group that includes also *P. orpheus*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Two subspecies recognized.

**Subspecies and Distribution.**

*P. n. ilsa* Rensch, 1928 – Sumbawa, in W Lesser Sunda Is.

*P. n. nudigula* E. J. O. Hartert, 1897 – Flores, in WC Lesser Sundas.

**Descriptive notes.** 19.5 cm. Male nominate race has head black, upperparts olive, rump with yellowish tinge; upperwing dusky brown, remiges edged olive on outer webs (primaries narrowly, tertiaries broadly), wing-coverts broadly edged olive; tail black; chin and upper throat black, bare patch on lower throat deep red, centre of upper breast black, remainder of underparts yellowish-olive, centre of belly, crissum and undertail-coverts lighter, flanks and thighs washed olive; iris dark brown to reddish-brown; bill black; legs dark grey. Female has crown grey, throat greyish-white with small bare patch (normally concealed).

Immature is like female, but throat yellow without bare patch. Race *ilsa* is brighter than nominate, underparts more yellow-green. **Voice.** Song loud, clear notes, with considerable individual and local variation; range of phrases sung in seemingly random sequence, one sequence consists of 11–12 rather monotonous, moderately pitched single or disyllabic whistles often followed by marked change in pitch and 3–4 rather short, sweet, soft rising notes, or trill-like whistle. Also bell-like notes and squeaks; harsh scolding call by female. Mimics variety of other birds species, including crows (Corvidae), Old World orioles (Oriolidae), domestic fowl (*Gallus*) and drongos (Dicuridae). **Habitat.** Primary and tall secondary moist hill and montane forest, also casuarina (*Casuarina*) forest and degraded forest where canopy retained; at 200–1730 m on Sumbawa and 400–2000 m on Flores. Most often along rivers and in montane forest above 1200 m; avoids semi-deciduous forest.

**Food and Feeding.** Insects and spiders (Araneae). Frequents understorey and middle storey. Prey captured by gleaning from branches and foliage.

**Breeding.** Season May–Jul. No other information available.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Northern Nusa Tenggara EBA. Locally common to very common on Flores, from which most specimens known; rarer on Sumbawa. Common in suitable habitat, but such areas highly restricted; likely habitat for both islands combined less than 2000 km<sup>2</sup>, probably c. 1500 km<sup>2</sup>. Although currently in conservation category of Least Concern, may warrant upgrading to Near-threatened. Potential threats are loss and modification of habitat and, on Sumbawa (apparently not on Flores), high level of trapping for cagebird trade; trapping pressure somewhat ameliorated by species' preference for forest levels where relatively difficult to capture. Many individuals die during capture and transport, only c. 10–20% surviving to reach markets; in captivity die from stress and possibly incorrect diet, usually surviving for less than 1 year.

**Bibliography.** Butchart *et al.* (1996), Forth (1998), Holmes (1993), Johnstone *et al.* (1996), Mees (2006), Rensch (1931), Trainor (2002), Verhoye & Holmes (1999).

## 24. Vogelkop Whistler

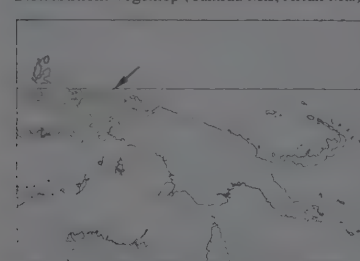
### *Pachycephala meyeri*

**French:** Siffleur du Vogelkop **German:** Braunohr-Dickkopf **Spanish:** Silbador de Vogelkop  
**Other common names:** Grey-crowned/Meyer's Whistler

**Taxonomy.** *Pachycephala meyeri* Salvadori, 1890, Arfak Mountains, New Guinea.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Monotypic.

**Distribution.** Vogelkop (Tamrau Mts, Arfak Mts), possibly also Foya Mts, in W New Guinea.



**Descriptive notes.** 14.5 cm; 17–20 g. Crown is slaty grey, ear-coverts greyish-brown, upperparts olive-green; remiges fuscous, edged olive-green, wing-coverts olive-green, tail olive-green; throat greyish-white, feathers with faint dusky tips, breast pale buff-grey (forming obscure band), belly and undertail-coverts pale sulphur-yellow; iris brown; bill black; legs grey. Sexes similar. Juvenile undescribed. **Voice.** Song a series of descending whistles, usually finishing with loud upslurred note.

**Habitat.** Lower montane forest and thickets; 970–1450 m.

**Food and Feeding.** No definite information.

Hover-gleaning by individuals thought to be of this species reported from Foya Mts.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Papuan Highlands EBA. Very poorly known species. Appears to be reasonably common in very small range. Possible presence in Foya Mts requires confirmation.

**Bibliography.** Butchart *et al.* (1996), Forth (1998), Holmes (1993), Johnstone *et al.* (1996), Mayr & Meyer de Schauensee (1939b), Rand & Gilliard (1967).

## 25. Sclater's Whistler

### *Pachycephala soror*

**French:** Siffleur de Slater **German:** Grünackchen-Dickkopf **Spanish:** Silbador de Slater  
**Other common names:** Hill Golden Whistler

**Taxonomy.** *Pachycephala soror* P. L. Slater, 1874, Hatam, Arfak Mountains, New Guinea.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P.*

*aurea*. Races *klossi* and *bartoni* intergrade in Huon Peninsula and Central Highlands. Population in Fakfak Mts, included within *octogenarii*, almost certainly represents a further, as yet undescribed race, but no specimens available. Five subspecies currently recognized.

**Subspecies and Distribution.**

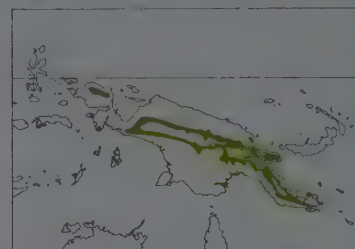
*P. s. soror* P. L. Slater, 1874 – Vogelkop (Tamrau Mts, Arfak Mts), in NW New Guinea.

*P. s. octogenarii* Diamond, 1985 – Bomberai Peninsula (Fakfak Mts, Kumawa Mts), in W New Guinea.

*P. s. klossi* Ogilvie-Grant, 1915 – mountain ranges of C New Guinea from Weylani Mts E to Bismarck Range and Kubor Mts, also Adelbert Mts and Huon Peninsula (Saruwaged Mts).

*P. s. bartoni* Ogilvie-Grant, 1915 – mountains of SE New Guinea, including Herzog Mts.

*P. s. remota* Mayr & Van Deusen, 1956 – mountains of Goodenough I, in D'Entrecasteaux Archipelago (off SE New Guinea).



**Descriptive notes.** 15 cm; 22–27 g. Male nominate race has crown, nape and side of head to below orbit black, upperparts dark olive-green; upperwing and tail dusky, all feathers edged olive; chin and throat white, band across upper breast and along side of throat joining back of head black, remainder of underparts yellow; iris dark red to dark brown; bill black; legs greyish to blackish. Female has crown grey-brown, side of head brown, upperparts olive-green, tail black, rectrices edged olive-green; throat white, faintly mottled with greyish, breastband yellowish-olive (broader than male's and ill-defined), belly and

undertail-coverts yellow. Juvenile is largely reddish-chestnut on body and on tips of wing-coverts and upperpart-coverts; immature like female, but retaining juvenile wing-coverts. Race *octogenarii* male has crown and side of head dark grey, breastband very narrow, rectrices edged olive, population in Fakfak Mts similar except for ochraceous posterior border of breastband; *klossi* has much broader breastband, with tail black in both sexes; *bartoni* has tail green with black shaft streaks; *remota* is similar to previous but somewhat larger, with underparts slightly richer yellow. **Voice.** Song 4–15 loud, fairly rapid, high-pitched, variable (monotone, upslurred or downslurred) and increasingly loud whistles, often terminating with loud upslur or downslur, "whee-whee-whee-whee-whee-chiew". Also, short series of successively lower monotone whistles, followed by rising "whee".

**Habitat.** Forest, forest edges and secondary growth at 350–2450 m, mainly 1000–2000 m (lower montane forest); at 550–1300 m (occasionally down to 400 and up to 1450 m) in Kumawa Mts, and at 600–1200 m, at least, in Fakfak Mts. Broadly overlaps with *P. simplex* and *P. hypertyra* at lower altitudes and with *P. schlegelii* at higher elevations.

**Food and Feeding.** Insects. Frequents lower and middle storeys of forest in about equal proportions, foraging in inner third of trees; on Bomberai Peninsula often in canopy above 9 m. Captures prey by gleaning from branches. Joins mixed-species foraging parties.

**Breeding.** Nest with eggs in Jan and laying female in Jun, indicative of breeding during both wet and dry seasons. Nest a small cup made from stems, leaves, some moss and spider web, placed 1.5–6 m from ground in upright forked branch in small tree or on horizontal branch in vine tangle. Clutch 1–2 eggs, pinkish-cream, with dark brown and dark purple-grey blotches forming broad band around larger end, 23.8–25.8 × 17.6–18.2 mm. No other information.

**Movements.** Presumably sedentary; possible local altitudinal shifts by parts of population, as individuals encountered below 1000 m invariably in female or immature plumage.

**Status and Conservation.** Not globally threatened. Generally fairly common in main altitudinal range, but scarce at lower elevations.

**Bibliography.** Coates (1990), Diamond (1972, 1985), Galbraith (1956), Harrison & Frith (1970), Hartert (1930), Hartert *et al.* (1936), Iredale (1956), Mayr (1931b), Mayr & van Deusen (1956), Mayr & Gilliard (1954), Ogilvie-Grant (1915), Rand & Gilliard (1967), Salvadori (1881).

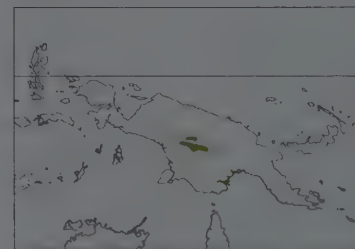
## 26. Lorentz's Whistler

### *Pachycephala lorentzi*

**French:** Siffleur de Lorentz **German:** Lorentzdickkopf **Spanish:** Silbador de Lorentz

**Taxonomy.** *Pachycephala schlegelii lorentzi* Mayr, 1931, Hellwig Mountains, Oranje Range, New Guinea. Originally considered conspecific with *P. schlegelii*, but subsequently discovered to occur sympatrically with that species. Both are members of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Monotypic.

**Distribution.** Highlands of C New Guinea from E Snow Mts E to Hindenburg Mts and Victor Emanuel Range.



**Descriptive notes.** 15–16.5 cm; 18–20 g. Crown, side of head and nape are grey, back olive-green; upperwing and tail black, remiges and wing-coverts edged olive-green; throat white, mottled with medium grey and blotched darker grey, grading into grey on upper breast; remainder of underparts dull yellow, flanks tinged olive; iris dark brown; bill black; legs slate-coloured. Sexes alike. Juvenile has plumage mostly chestnut-red; immature has throat and breast white, belly grey. **Voice.** Song a whistled "swit swit wit wit wit toe wit" or "whit sweet tyuu", increasing in volume.

**Habitat.** Mid-montane forest, mossy forest of

southern beech (*Nothofagus*), and alpine shrub growth, at 1750–3800 m. Where range overlaps with that of *P. schlegelii*, it replaces that species above 2000 m, but the two co-exist lower in altitudinal range.

**Food and Feeding.** Insects. Gleans prey mainly in lower to middle storeys of forest; forages also at tops of saplings in clearings. No reported differences from *P. schlegelii*.

**Breeding.** Male in breeding condition in late Aug. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains EBA. Fairly common.

**Bibliography.** Beecher *et al.* (1986), Coates (1990), Gilliard & LeCroy (1961a), Gregory & Johnstone (1993), Iredale (1956), Junge (1953), Mayr (1931b), Ogilvie-Grant (1915), van Oort (1910b), Rand (1941), Rand & Gilliard (1967), Rothschild & Hartert (1913).

## 27. Regent Whistler

### *Pachycephala schlegelii*

**French:** Siffleur de Schlegel **German:** Schlegeldickkopf **Spanish:** Silbador de Schlegel  
**Other common names:** Schlegel's Whistler

**Taxonomy.** *Pachycephala schlegelii* Schlegel, 1871, Arfak Mountains, New Guinea.

Formerly considered conspecific with *P. lorentzi*, but found to occur sympatrically with that species. Both are members of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquini*, *P. flavifrons*, *P. melanura* and *P. aurea*. Racial identity of birds in Kumawa Mts (Bomberai Peninsula) and Torricelli Mts (North Coastal Range) uncertain; provisionally included in, respectively, nominate race and *obscurior*. Three subspecies currently recognized.

#### Subspecies and Distribution.

*P. s. schlegelii* Schlegel, 1871 – mountains of Vogelkop (Tamrau Mts, Arfak Mts) and Bomberai Peninsula (Kumawa Mts) and Wandammen Mts, in NW New Guinea.

*P. s. cyclopum* E. J. O. Hartert, 1930 – Cyclops Mts, in CN New Guinea.

*P. s. obscurior* E. J. O. Hartert, 1896 – mountain ranges of New Guinea E from Weyland Mts, including North Coastal Range (Torricelli Mts), Huon Peninsula (Saruwaged Mts) and SE peninsula.

**Descriptive notes.** 15–16.5 cm; 19–25 g. Male nominate race has top and side of head and nape black, yellow collar on hindneck; upperparts dark olive-green, upperwing and tail black, outer primaries narrowly edged light brown; chin black, throat white; upper breast black, extending laterally to black of nape, remainder of underparts yellow, lower breast and belly strongly washed orange; iris dark brown; bill black; legs grey. Female has top and side of head and nape grey, upperparts olive-green, upperwing and tail as male except that inner primaries and secondaries edged olive-green on outer webs, wing-coverts broadly edged



olive-green; chin and upper breast grey, throat white with dusky mottling, broad olive-green band on lower breast, flanks olive-green, remainder of underparts yellow. Juvenile has plumage mainly reddish-chestnut; immature like female. Race *obscurior* has belly somewhat more ochraceous than nominate; *cyclopum* has bill larger, wing longer, female with upperparts more greenish, breast paler. Voice. Song c. 10 alternately rising and falling notes, increasing in speed, volume and pitch, with short higher-pitched finish; also variations on "squeetch-squeetch-squetch-chu"; also loud, evenly pitched notes, "see, pit-pit-pit teu-teu-teu". Calls include "tcheur-whip!", series of explosive whistles; also cat-like "meow", becoming louder and with terminal explosive whistle; possible contact call a short "tsip"; also gives rapid trill.

**Habitat.** Forest and forest edge at 1300–3650 m, mainly above 1850 m. At lower elevations replaced by *P. soror*, sometimes with considerable overlap; replaced above 2700 m by *P. lorentzi* where ranges overlap, but the two co-exist at lower elevations.

**Food and Feeding.** Insects; sometimes seeds. At lower altitudes forages in lower (60%) and middle (c. 40%) storeys, where feeds in inner two-thirds of tree (large and small branches, etc.); in upper montane zone shifts upwards, foraging in canopy (c. 15%), middle storey (c. 80%) and lower storey (c. 5%), and more in middle to outer thirds of tree (branches and outer foliage). Obtains prey by gleaning.

**Breeding.** Males with enlarged testes in Jul–Sept and fledgling in early Sept. Clutch 2 eggs, white, with small black and purple spots concentrated as wreath at larger end, 26.9–28 × 20–20.6 mm. No other information available.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Reported to be common to abundant in middle and upper parts of range; scarcer at lower elevations. On Mt Karimui (EC New Guinea), present

species accounted for less than 1% of avifauna below 1760 m, the figure rising to 4% at c. 1800 m, and reaching 11% at 2400 m.

**Bibliography.** Bell (1971), Clapp (1986), Coates (1990), Croxall (1977), Diamond (1972), Frith (1971b), Frith & Frith (1993b), Galbraith (1956), Gilliard & LeCroy (1961a), Gyldestolpe (1955a), Hartert (1930), Hoogerwerf (1971), Iredale (1956), Junge (1953), Mayr (1931b), Mayr & Rand (1937), Ogilvie-Grant (1915), Peckover & Filewood (1976), Rand (1942b), Rand & Gilliard (1967), Rothschild & Hartert (1903a), Salvadori (1881).

## 28. Hooded Whistler

### *Pachycephala implicata*

**French:** Siffleur des Salomon **German:** Olivbauch-Dickkopf **Spanish:** Silbador de las Salomón  
**Other common names:** Mountain/Solomon (Mountain) Whistler

**Taxonomy.** *Pachycephala implicata* E. J. O. Hartert, 1929, Guadalcanal, Solomon Islands.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. pectoralis*, *P. caledonica*, *P. jacquini*, *P. flavifrons*, *P. melanura* and *P. aurea*. Races exhibit distinct male and female plumage differences, and possibly better treated as two separate species. Two subspecies recognized.

#### Subspecies and Distribution.

*P. i. richardsi* Mayr, 1932 – Bougainville I.

*P. i. implicata* E. J. O. Hartert, 1929 – Guadalcanal, in S Solomon Is.



**Descriptive notes.** 16.5 cm; 33–38 g. Male nominate race has head black, mantle to upperwing, rump and uppertail-coverts olive; tail black; chin to cheeks and upper breast dark grey, remainder of underparts yellowish-olive; iris dark red-brown; bill black; legs dark grey. Female has crown and side of head grey, cheek pale grey with slight mottling, back greenish-olive, remiges black, edged olive, tail dusky, edged brown; chin grey with slight mottling, throat and upper breast pale grey, remainder of underparts olive-yellow; iris dark brown. Juvenile is similar to female but crown dark olive, upperparts and underparts extensively

rufous; immature as adult female. Race *richardsi* male has entire head and breast black, upperparts yellow-olive, underparts below breast yellow with light olive wash, female with lower throat and upper breast pale buffy grey. **VOICE.** Song on Bougainville a loud, rising "chu chu chu chu chu", alternately higher and lower notes, "wee wee wee wee whip!" and "wur chi wur chi wur chi woo!"; on Guadalcanal a loud disyllable followed by quieter note, "witchoo wi witchoo, witchoo wi woo", no acceleration or crescendo; female gives single low melancholy whistle, "whew whew...". Also harsh "chik" and "chur-chik".

**Habitat.** Forest, including mistforest at high elevations; at 1200–2000 m, at least. Co-exists with *P. pectoralis* at some localities, but replaces that species above 1500 m on Bougainville and above 1400 m on Guadalcanal.

**Food and Feeding.** Insects, mainly soft-bodied ones, including Orthoptera and grubs; some small snails taken, also berries and seeds. Forages mainly in understorey, occasionally to middle storey and canopy. Prey captured by gleaning along small branches.

**Breeding.** Fledgling seen in Oct. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Solomon Group EBA. Reported to be generally uncommon, although locally common, for example: on Bougainville common at c. 2000 m; on Guadalcanal generally commoner above 1400 m, where it replaces *P. pectoralis*.

**Bibliography.** Cain & Galbraith (1956), Coates (1990), Diamond (1975), Dutson (2007b), Hadden (2004), Hartert (1929), Mayr (1932a), Mayr & Diamond (2001), Schodde (1977).







## 29. Golden Whistler

### *Pachycephala pectoralis*

**French:** Siffleur doré **German:** Gelbbauch-Dickkopf **Spanish:** Silbador Dorado  
**Other common names:** Common Golden Whistler; Balim Whistler (*balim*); Norfolk (Island) Whistler (*xanthoprocta*); Banda Sea Whistler (Banda Sea races); Bismarck Whistler (races in Bismarck Archipelago and on islands off SE New Guinea); Black-chinned Whistler (Moluccan races); Fiji Whistler (races in Fiji and Santa Cruz Is); Fulvous-tinted Whistler (Lesser Sundan races); Yellow-throated/Oriole Whistler (races in Solomon Is)

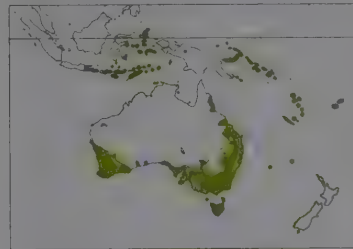
**Taxonomy.** [*Muscicapa*] *pectoralis* Latham, 1801, Port Jackson, Sydney, New South Wales, Australia.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Formerly treated as conspecific with one or more of those, especially *P. caledonica*, *P. jacquinoti* and *P. melanura*. Provides one of the most complex examples of geographical variation in the avian world; more than 70 geographical races have been named, on basis mainly of variation in overall size and bill size, and numerous plumage characters of both males (including colour of crown, back, throat and tail, and presence and/or colour of hindneck-collar and breastband) and females (variation more subtle, involves primarily amount of yellow or olive in plumage). Last major revision, as long ago as mid-1950s, identified eight groups of races (A–H), circumscribed broadly as follows: A, Lesser Sunda Is (“*fulvotincta* group”); B, Moluccas (“*mentalis* group”); C, Solomon Is (“*orioloides* group”); D, Fiji (“*vitiensis* group”); E, New Guinea, Bismarck Archipelago and N Australia (“*citreogaster* group”); F, S Australia (“*nominate* group”); G, S Melanesia (New Caledonia, Loyalty Is, New Hebrides, Banks Is) (now an expanded *P. caledonica*); H, widespread (S Moluccas and Timor E through SE New Guinea, Bismarck Archipelago, Santa Cruz Is, Fiji and Tonga). First seven groups (A–G), which occupy discrete areas, are regarded as earlier colonizations; members of group H, considered to be a second wave of colonizers, are more uniform in appearance, with plumages that could be considered “typical” form for the species, characteristic of Australian populations. In several areas, members of Group H meet those of other groups, often hybridizing; also, races with distinctive plumage are connected with more “typical” ones by intermediate populations. Has been proposed to split present species into several species, elevating many of these groups to species rank (each often incorporating local members of group H); moreover, Rennell race *feminina* (in S Solomon Is), has been proposed as a separate, sexually monochromatic species. Although all of this may seem feasible, more detailed assessment of all the factors is required, and further study is warranted. In addition, other named races include: in Lesser Sunda Is *jubilarii* (Lombien E to Alor), merged with *fulvotincta*, and *arhuri* (Wetar), merged with *calliope*; in S Moluccas *alfurorum* (Seram), synonymized with *macrorhyncha*; and in Australia *occidentalis* (SW Western Australia), merged with *fuliginosa*, and *queenslandica* (region of Big Tableland, in NE Queensland) and *ashbyi* (S Queensland, extreme N New South Wales), both synonymized with nominate. Fifty-nine subspecies currently recognized.

#### Subspecies and Distribution.

*P. p. javana* E. J. O. Hartert, 1928 – E Java and Bali.  
*P. p. fulvotincta* Wallace, 1864 – Lesser Sunda Is (Sumbawa E to Alor).  
*P. p. fulviventr* E. J. O. Hartert, 1896 – Sumba.  
*P. p. teysmanni* Büttikofer, 1893 – Salayer I (off SW Sulawesi).  
*P. p. everetti* E. J. O. Hartert, 1896 – islands of Tanahjampea, Kalaotoa and Madu (S of Sulawesi).  
*P. p. pelengensis* Neumann, 1941 – Banggai Is (E of Sulawesi).  
*P. p. clito* Wallace, 1863 – Sula Is (E of Sulawesi).  
*P. p. mentalis* Wallace, 1863 – Morotai, Halmahera, Bacan.  
*P. p. tidorensis* van Bemmelen, 1939 – Ternate and Tidore (off W Halmahera).  
*P. p. obiensis* Salvadori, 1878 – Obi.  
*P. p. buruensis* E. J. O. Hartert, 1899 – Buru.  
*P. p. macrorhyncha* Strickland, 1849 – Seram and Ambon.  
*P. p. calliope* Bonaparte, 1850 – Wetar, Timor and Semau.  
*P. p. par* E. J. O. Hartert, 1904 – Roma I (E Lesser Sundas).  
*P. p. dammeriana* E. J. O. Hartert, 1900 – Damar I.  
*P. p. compar* E. J. O. Hartert, 1904 – Leti Archipelago (Leti, Moa), in E Lesser Sundas.  
*P. p. sharpei* A. B. Meyer, 1884 – Babar I.  
*P. p. fuscoflava* P. L. Selater, 1883 – Tanimbar Is (Larat, Yamdena).  
*P. p. balim* Rand, 1940 – WC New Guinea (N slopes of Snow Mts).  
*P. p. goodsoni* Rothschild & E. J. O. Hartert, 1914 – Admiralty Is.  
*P. p. sexuvaria* Rothschild & E. J. O. Hartert, 1924 – St Matthias Group.  
*P. p. citreogaster* E. P. Ramsay, 1876 – Bismarck Archipelago (New Hanover, Djaul, New Ireland, Feni, Umboi, New Britain, Nusa, Tolokiva).  
*P. p. tabarensis* Mayr, 1955 – Bismarck Archipelago: Tabar (off E New Ireland).  
*P. p. ottomayeri* Stresemann, 1933 – Bismarck Archipelago: Lihir (off E New Ireland).  
*P. p. collaris* E. P. Ramsay, 1878 – Louisiade Archipelago (Egum, Bonvouloir Group, Conflict Group, Teste, Deboyne Group, Misima, Renard), off SE New Guinea.  
*P. p. rosseliana* E. J. O. Hartert, 1898 – Rossel I (SE Louisiades).  
*P. p. bougainvillei* Mayr, 1932 – Buka, Bougainville I and NW Solomon Is (Shortland Is).  
*P. p. orioloides* Pucheran, 1853 – W & C Solomons (Choiseul, Malakobi, Santa Isabel, Florida Is).  
*P. p. pavuvu* Mayr, 1932 – Russell Is (Banika, Pavuvu, Moie), in SC Solomons.  
*P. p. melanota* E. J. O. Hartert, 1908 – W Solomons (Vella Lavella, Ranongga).  
*P. p. centralis* Mayr, 1932 – W Solomons (Kolombangara, New Georgia, Vangunu, Ngatokae).  
*P. p. melanoptera* Mayr, 1932 – W Solomons (Rendova, Tetepare).  
*P. p. sanfordi* Mayr, 1931 – Malaita (SE Solomons).  
*P. p. cinnamomea* (E. P. Ramsay, 1879) – Guadalcanal and Beagle I.  
*P. p. christophori* Tristram, 1879 – Solomon Is: San Cristobal and Santa Ana.  
*P. p. feminina* Mayr, 1931 – Rennell in S Solomons.  
*P. p. ornata* Mayr, 1932 – N Santa Cruz Is (Swallow Is, Reef Is, Tuff Is).  
*P. p. utupua* Mayr, 1932 – C Santa Cruz Is (Utupua).  
*P. p. vanikorensis* Oustalet, 1877 – S Santa Cruz Is (Vanikoro).  
*P. p. unata* Sharpe, 1900 – Banks Is and N & C Vanuatu (S to E side).  
*P. p. chlorura* G. R. Gray, 1860 – Erromango, SC Vanuatu.  
*P. p. cucullata* G. R. Gray, 1860 – Aniwan, S Vanuatu.  
*P. p. littoralis* L. Layard, 1878 – Loyalty Is (Lifu, Uvea).  
*P. p. aurantiventris* Seeborn, 1891 – Vanuatu and Vanua Levu (except SE coast), in N Fiji.  
*P. p. ambigua* Mayr, 1932 – Vanua Levu (Cankandrose Peninsula), Rabi and Koro.  
*P. p. tosqiana* F. L. Layard, 1878 – Tavenu.  
*P. p. graeffii* Hartlaub, 1866 – Waya and Viti Levu, in W Fiji.  
*P. p. optata* Hartlaub, 1866 – Viti Levu (SE coast) and Ovalau.

*P. p. koroana* Mayr, 1932 – Koro (C Fiji).  
*P. p. vitiensis* G. R. Gray, 1860 – Ngau (C Fiji).  
*P. p. kandavensis* E. P. Ramsay, 1876 – SW Fiji (Vanua Kula, Bega, Ono, Kadavu).  
*P. p. bella* Mayr, 1932 – Vatu Vara, in EC Fiji.  
*P. p. lauana* Mayr, 1932 – S Lau Archipelago (Ogea Levu, Fulanga, Wangava), in SE Fiji.  
*P. p. fuliginosa* Vigors & Horsfield, 1827 – SW & S Australia.  
*P. p. pectoralis* (Latham, 1801) – F Australia (E Queensland, NE New South Wales).  
*P. p. youngi* Mathews, 1912 – SE Australia.  
*P. p. glaucura* Gould, 1845 – Bass Strait islands (King I, Flinders I) and Tasmania.  
*P. p. contempta* E. J. O. Hartert, 1898 – Lord Howe I.  
*P. p. xanthoprocta* Gould, 1838 – Norfolk I.



**Descriptive notes.** 16–19 cm; 19–32 g (many races), variable (e.g. *kandavensis* 25 g, *orioloides* 58 g). Male nominate race has top and side of head and nape black, this colour extending across upper breast as black breastband, enclosing white chin, throat and malar area; collar on hindneck yellow, extending to side of breast; upperparts yellow-olive, slightly paler on rump and uppertail-coverts; remiges sooty black, edged olive-grey on outer webs (finely so on primaries, narrowly on secondaries, broadly on tertiaries), upperside-coverts sooty grey, edged and tipped olive-yellow; tail black, base dark grey-brown, rectrices narrow.

rowly tipped grey; underparts below breastband yellow, flanks tinged olive; iris dark red; bill black; legs greyish-black to black. Female has top and side of head brown to greyish-brown, merging with dark olive-brown on upperparts, uppertail-coverts tinged olive, lores pale brownish-grey, ear-coverts grey-brown; upperside-coverts tinged olive, remiges edged grey-olive (increasing in extent from primaries to tertiaries), wing-coverts edged and tipped olive-grey, tail dark olive-brown, rectrices narrowly edged olive; chin and throat off-white with faint grey-brown barring, breast light brown, belly and flanks off-white, crissum and undertail-coverts pale yellow. Juvenile has body almost entirely rufous, remiges sooty brown, edged rufous on outer web (broadly so on tertiaries, becoming finer towards primaries), primary coverts edged rufous, greater and median secondary coverts rufous, rectrices edged rufous, iris and bill dark brown; first immature as adult female except for retention of juvenile remiges, wing-coverts (forming rufous wing patch) and rectrices, also has brown eyes and bill; second and third immature males indistinguishable from adult female. Races vary considerably in size and plumage: *youngi* is large, like nominate, male with yellow collar narrower, back and underparts not so bright, tail black with broader grey base, edging of remiges and wing-coverts duller, female upperparts and tail dull medium grey, lower breast and belly greyish-white, crissum white; *fuliginosa* is as previous, but male upperparts less bright, tail grey and broadly tipped black, female underparts browner; *glaucura* is also similar, but male collar narrower, back and edging of remiges and wing-coverts duller, tail medium grey with narrow black tip, lower breast lemon-yellow, grading to whitish on crissum, female back and tail dull brownish-grey, lower breast and belly greyish-white, crissum white; *contempta* is like nominate but smaller, male tail greyer with broad black subterminal bar, underparts lightly washed olive, female slightly darker, upperparts browner, underparts slightly lighter; *xanthoprocta* both sexes are like female nominate, but upperparts more olive, tail slightly browner, lower breast and belly somewhat yellower; *balim* male has back and edges of secondaries olive-green, female with crown brown, mantle bright olive, secondaries as male, throat and breast shaft-streaked, belly and flanks deep yellow, tail black, rectrices edged olive basally; *fulviventr* is very small, male with yellow hindcollar, tail black, chin black, throat white (not reaching ear-coverts), breastband narrow, breast and belly washed rufous, female crown grey, upperparts pale sandy olive, throat whitish, breastband pale greyish; *javana* resembles previous, but male with white of throat reaching ear-coverts, tail narrowly tipped pale, underparts paler rufous, female throat pinkish-buff, *fulvotincta* differs from last in that male has only breast washed rufous, female crown sandier, upperparts sandy brown, breast pinkish; *everetti* male is like previous, but breast with only slight rufous wash, black mottled black, wing black, female with throat white, breast and belly more pinkish; *teysmanni* male is hen-plumaged, crown grey, upperparts olive, rump yellower, ear-coverts grey, throat white, underparts pinkish, belly tinged yellow, female similar but lores ochraceous, ear-coverts rufous; *mentalis* is large, tail black, chin black, throat white with feathers long (overlapping breastband), black breastband narrow (not meeting ear-coverts), female crown grey, upperparts olive, throat barred grey and white, breastband grey, breast and sides olive, belly lemon; *tidorensis* is like previous but slightly larger, female with crown slightly paler and olive areas yellower; *obiensis* male has chin white, throat feathers not so elongated, female crown and mantle brownish, throat bars and band below throat buff, breast and flanks washed orangish, belly bright yellow; *orioloides* is very large, male crown and side of face black, collar golden-yellow, upperparts and edges of uppertail-coverts citrine-olive, primaries edged grey, wing-coverts edged citrine-olive, tail blackish, rectrices tipped pale olive, underparts bright golden-yellow, moderate breastband black, female variable, upperparts dull olive to brownish-olive, blackish-brown remiges edged russet, outermost primaries pale russet with olive-cinnamon tinge, wing-coverts edged russet, tail brownish-olive underparts yellow, breast and flanks often washed olive or rufous, occasionally streaked grey-olive; *bougainvillei* is similar to previous, male with upperparts more citrine-olive, breastband broader, lower belly more golden, female upperparts duller olive, underparts strongly washed greyish (yellow tones almost absent on underside); *pavuvu* is also similar, but male back lighter olive, uppertail-coverts more broadly edged olive, rectrices with yellow bases, female has bill yellow, upperparts lighter, underparts yellow without strong russet wash, edges of remiges and wing-coverts much lighter and washed olive; *cinnamomea* male like *orioloides*, female has upperparts dull greyish-olive, usually heavily washed rufous, edges of remiges and wing-coverts lighter, primaries lacking olive tinge, underside light buff with faint yellow tinge, breast and flanks streaked pale grey and washed pale russet, undertail-coverts and thighs pale yellow; *sanfordi* male has crown and side of head black, collar reduced to trace, upperparts dark yellowish-olive, uppertail-coverts black, edged olive, breastband absent, female bill blackish-brown, crown brownish-citrine, cheek with yellowish wash, mantle citrine, tail olivaceous brown, throat whitish (feathers sometimes tipped black), underparts faintly washed yellow with conspicuous shaft streaks, breast greyish; *melanota* male has side of head, upperparts, wing, tail and chin black, throat, belly and undertail-coverts golden-yellow, breastband very broad, female very variable, crown and side of face rusty brown, upperparts dark rufous-brown sometimes mixed with black, tail blackish rufous-brown, underparts yellow, indistinct breastband rufous sometimes mixed with black, chin, throat, belly and undertail-coverts faintly streaked black, bill black; *melanoptera* male has collar indistinct, back greenish (often with darker spots), wing deep black with lesser coverts edged olive, female crown rufous-brown, upperparts rufous-brown with dull olive tinge (especially rump), uppertail-coverts dull olive, tinged rufous, dusky remiges edged russet, tail rufous-tinged dull olive, underparts cinnamon-rufous, belly with



pale yellow wash, bill black; *centralis* male is like *orioloides* but smaller, collar narrower (often almost absent), back greener, female head rufous-olive or brownish-olive, collar absent, upperparts dark greenish-olive, primaries edged olive, pale yellow below (throat often whitish), breast and flanks washed olive; *christophori* male has crown variably dark citrine, blackish-olive or entirely black, ear-coverts olivaceous cinnamon to black, neck side yellow or light olive (broken collar), upperparts olive, underparts yellow, breastband black (often yellow or olive tips on lateral and posterior feathers), belly sometimes washed brown, female upperparts olive, side of head brownier, underparts yellowish, more or less distinct breastband olive; *feminina* male is hen-plumaged, crown brownish-olive, side of face rusty, collar rusty olive, upperparts dark olive, rump feathers tipped yellowish-olive, uppertail-coverts brownish-olive, tail dark olive-brown, underparts citrine-yellow, breast and flanks tinged olive or rusty olive, undertail-coverts buffy yellow, female same or somewhat duller; *cucullata* is small, male with crown and ear-coverts dull black, slightly scalloped olive, collar narrow and washed olive, mantle very brown, rump and tail washed brownish, secondaries edged brown, breastband narrow, breast and belly lemon-yellow, flanks and undertail-coverts ochraceous, female crown and ear-coverts brownish, mantle brown, throat brownish, breast and belly faintly washed yellow, undertail-coverts pale yellow; *chlorura* male has collar very narrow, mantle greenish-olive, rectrices (except central) with black patches on inner webs, female mantle dull olive, throat greyish, underparts lightly washed yellow; *intacta* is as previous, but male mantle slightly more yellow, female crown and ear-coverts greyish; *vanikorensis* male has mantle greenish-olive, uppertail-coverts with black centres, tail black, breastband broad, female crown and ear-coverts grey, throat olive with darker streaks, lower breast and belly lemon-yellow; *littayei* is very large, male mantle and upperwings olive-green, collar narrow and washed olive, uppertail-coverts and tail olive, breastband narrow, breast and belly golden-yellow, female throat white, narrow breastband greenish-yellow, belly golden-yellow; *graeffii* is medium-sized, male with forehead and supraloral spot yellow, collar absent, upperparts dark olive, remiges and rectrices olive-black, former edged and latter tipped olive, uppertail-coverts olive, underparts yellow, breastband incomplete (black bases of feathers sometimes visible), female has forehead and face lightly washed yellow, upperparts dark olive-brown, underparts brown-mottled cinnamon-grey; *optata* is similar to last, but male breastband often more or less complete (varying individually); *aurantiventris* is also similar, but male has larger supraloral spot, upperparts darker olive, remiges edged with grey, breastband almost non-existent, underparts darker, more orange-yellow, female similar to *graeffii*; *ambigua* is like previous, but male breastband more or less complete (varying individually), female underparts less strongly marked; *bella* male has supraloral spot orange-yellow, collar narrow, uppertail-coverts with black centres, chin and throat golden-yellow, breastband broad, underparts washed brown, female rufous-brown, face without yellow wash, underparts paler without mottling; *torquata* is like previous, but male supraloral spot sometimes absent, breastband narrower, underparts slightly paler, female slightly more rufous; *koroana* is similar to last, but male lacks supraloral spot, has chin and throat richer golden-yellow, undertail-coverts more ochraceous, female uniformly darker. Remaining races (group H) variable in size (small to very large), exhibit variations on standard plumage pattern, male with crown and side of face black, collar yellow, mantle golden-yellow, uppertail-coverts and tail black with olive tips, wing dull black with olive edgings (becoming greyer towards outer primaries), chin and throat white, breastband black (reaching ear-coverts), remainder of underparts golden-yellow, female upperparts brownish, crown greyer (not strongly contrasting), wing blackish-brown with citrine feather edgings (greyer towards outer primaries), largely whitish below, throat pale buff, breast brownish (vaguely defined breastband), breast and belly washed yellow, undertail-coverts yellow; *macrorhyncha* male has mantle brownish-olive, uppertail-coverts black, throat feathers long (separating ear-coverts from breastband), primary coverts black, female crown olive-brown, upperparts dull brown, throat whitish, breast greyish, breast and belly moderately washed yellow; *caliope* is small, male collar washed olive, primaries edged grey, uppertail-coverts and tail olive, breast and belly lemon-yellow, female upperparts dull sandy olive, crown greyer, throat white with greyish band below, remainder of underparts buffy with yellow wash; *sharpei* has bill large, male collar washed olive, tail partly olive, breastband with white streaking, breast and belly lemon-yellow, female upperparts brownish-olive, tail olive, throat white, breast grey-buff (narrow band), breast and flanks tinged cinnamon, belly faintly washed yellow; *dammeriana* is small, male like *sharpei* but breastband without streaking, primaries edged grey, rectrices broadly edged olive, female similar to *caliope* but throat barred; *par* is olive-brown above, crown slightly greyer, rump slightly rufous, throat white, underparts buff, sexes alike; *compar* is similar to previous, but lores and supercilium pale buff, belly paler and yellower; *flavoflava* is very large, male collar very narrow, chin and throat yellow, breast and belly lemon-yellow, female throat yellowish-white, underparts slightly washed yellow; *buruensis* male has back dark greenish-olive, uppertail-coverts black and very narrowly edged olive, primary coverts black, breastband very narrow near ear-coverts, female mantle dull brownish-olive, faintly washed yellow, breastband greyer and somewhat darker than throat and belly, belly buffy brown; *clio* is small, like previous but male upperparts brighter and yellower, female throat whitish with darker barring, underparts slightly washed yellow; *pelengensis* is small, male similar to previous, female like previous but upperparts more olive, underparts deeper yellow; *collaris* male has collar washed olive, upperparts olive with brownish wash, secondaries edged brownish-olive, uppertail-coverts olive, tail olive with brownish wash (sometimes blackish subterminal patches), underparts orange-yellow, narrow breastband pale vinous, female mantle brownish-olive, throat white, breastband as male, breast and belly deep yellow; *russelliana* like previous but male has tail brownish with olive basally, female breast and belly yellow (tinged buff), bill brown; *curvicauda* is small, crown brownier than mantle, mantle brownish-olive, female breastband somewhat darker than throat and belly, breast and belly pale yellow; *sepiaria* is small, very like previous, female mantle slightly browner, breastband only slightly darker than throat and belly; *ottomeyeri* is very large, male underparts orange-yellow, female like previous; *tabarensis* is large, male like previous, female crown grey, mantle bright citrine, remiges edged brown, throat whitish, narrow breastband pale cinnamon, breast and belly deep yellow, breast with faint cinnamon wash; *gondensis* male has underparts orange-yellow, female like previous but faint cinnamon wash more extensive on belly; *attensis* male has collar very narrow, upperparts dark olive with slight black mottling, breastband narrow, undertail-coverts ochraceous, female crown grey, upperparts dark olive-brown, chin and throat pinkish-cinnamon, underparts buffy cinnamon; *lauana* is large, like previous but male back with more black mottling, remiges edged greyish, primary coverts black, female has mantle sandy-olive, underparts paler, belly very pale buffy white; *kemansensis* is small, crown washed olive, upperparts dull olive, uppertail-coverts olive-green, tail olive with black subterminal patches, breastband dull black and very narrow, remainder of underparts faintly washed yellow, female like previous but underparts washed yellow; *unipha* male has collar washed olive, underparts not so rich yellow, female crown grey, mantle brownish-olive, throat white, underparts cinnamon, breastband broad and dark brown, flanks washed brown; *gratia* male lacks yellow collar, has upperparts and primary coverts black, throat feathers long (separating ear-coverts from breastband), female mantle dull brownish-olive, throat whitish, underparts cinnamon, breast slightly darker, belly pale yellow. **Voice.** General song pattern consists of series of loud, clear whistles, sometimes varying in volume and speed, usually ending with 1–2 whirrrack-like notes, considerable geographical and individual variation, with extensive individual repertoires from limited number of notes. In Java and Bali, 3–4 repeated me-

lodic notes with lower-pitched whirrrack finish, “dee dee dee wit”. In Sula Is, a sharp upslur followed by 2 evenly pitched whistles, then slightly explosive note, “whit tu tu tsit”. Off Halmahera, c. 11 unhurried whistles, starting quietly, building to crescendo, with short, slightly explosive double-note finish. In Lesser Sundas: on Flores, 3–4 identical, loud whistles, level or gradually increasing in volume, “whit! whit! whit! whit!” and “whi-whi-whi-whi!” on Sumba, 6 medium-pitched whistles, “chong chong chong chong chong”, increasing in volume and speed, final 2 notes often shorter and more staccato; on Timor, 3–4 downward-inflected notes, rapidly followed by louder, lower, whirrrack note and high-pitched note, also “tee-tee-work-chop”, last notes inflected downwards and lower in pitch. In Australia, single, repeated, pure-toned note followed by shorter, sharp, high-pitched whirrrack note, “choo choo choo choo chip” or “peep peep peep pu-wit”; short song (in autumn–winter) 1–2 short notes, then whirrrack, “whi-whit” or “whi-whi-whit”; In Solomons region: on Bougainville, “chee chee chee chuit”, last 2 notes enunciated in manner of human sneeze; on Guadalcanal, series of loud liquid slurred whistles, accelerating and culminating in 1–2 violent disyllables, “weu weu wu; we-weu weu; weu weu, weuweu-weuweu wee-u wee-u wéet-éú”, often abbreviated, also two males countersinging “wéet-éú”, also “stui-tchi66” and loud slurred “wéé66”; on San Cristobal, very variable, harsher, less liquid than on Guadalcanal, repeated cycles of three parts, differing individually (several rather slow notes, or long rapid series, or variant on loud disyllable), e.g. “chree chree chree...” or “chung chung chung” or “chee-ow chee-ow” then “glug-lug-lug-lug...” or “che-ek-ek cheuk-cheuk...” or “chitchitchitchitchit cheek” and then “wéé-twéé” or “chéwít” or “wéé-ów wéé-ów”; on Rennell, song not typical of whistlers, very different from elsewhere in Solomons or Australia, loud and diverse, with constant-pitched notes, squeaks, mellow notes, impure tones, rapid doublets and triplets and slurs, characteristic repetition of a note 2–8 times first on one pitch then on another, each successive set louder, faster and less pure toned. In Vanuatu, “cheer-chee-chee-cheewet”, first notes slow, last ones rapid and explosive; calls on Efate and Santo similar to those on Guadalcanal. In Fiji: short series of musical whistled notes, “zoouou-zizwe” or “ti-tutwi-tuzwi”, with considerable individual variation; on Viti Levu whirrrack conclusion absent; on Taveuni usually present; on Lifu “weet, witchaya witchaya”, “wit, wit, wit, cheeewoo” and “wit, wit, wit, wit, wit, wit, weeee chew”. Other vocalizations: in Australia “tweet-a-weet-a-weet-a-weet”, and rising “seep” in autumn–winter; on Bougainville “weet-tu”; in Vanuatu short soft contact calls, harsh alarm calls; in Fiji “pli, pli, pli”.

**Habitat.** Timbered, usually mesic habitats, entering drier and modified habitats to varying extents; substantial differences across range. In Australia usually with dense understorey, e.g. rainforest, wet and dry eucalypt (*Eucalyptus*) forest and woodland (including mallee and riparian growth), dense dry shrubland, softwood scrubs, casuarina (*Casuarina*) woodland, *Melaleuca* woodland, *Banksia* woodland, sometimes gardens and parks, occasionally exotic pine plantations; on Lord Howe I lowland forest, remnant native vegetation, more common in lowlands than in mountains; on Norfolk I shrubby understorey of rainforest, palm forest, *Araucaria* rainforest, regenerating forest, gardens. In New Guinea, race *balim* mainly in secondary growth. In Java and Bali inhabits hill and montane forest, dense woodland, secondary growth; on Sumbawa all forested habitats, including rainforest, bamboo thickets, cultivated areas; on Roti mangroves, especially stands of *Rhizophora* and *Sonneratia*, on Pulau Ndana low vine thicket; on islands off Halmahera occurs in rainforest, less often in mangroves, swamp-forest; in Tanimbar Is primary and secondary forest, also scrub (including coastal scrub), wooded cultivation, locally mangroves. In Solomons Is (San Cristobal, Guadalcanal) forest up to edge of mistforest, always in broken places or somewhat open forest, very seldom in secondary growth; avoids vine-tangled thickets near coast. In Vanuatu forest, secondary growth, open wooded country, plantations, gardens, on Efate and Santo also in vine-tangled thickets near coast. In Fiji, inhabits forest and secondary forest on Viti Levu. Elevational range varies, to some extent related to height of mountains and presence of other species: in New Guinea (race *balim*) 1600–2400 m; in Australia lowlands to higher altitudes, 500–1500 m in N Queensland, in Southern Alps above 1300 m when breeding, below 1000 m in winter; in Indonesia/Wallacea 20–1200 m on Sumbawa, to at least 950 m on Sumba, to above 1200 m on Flores, to 2100 m on Timor; to 1200 m on Halmahera islands, sea-level to above 1000 m in Sula Is (Taliabu), 100–1460 m (mostly above 600 m) on Seram, to 1250 m on Buru; on Bougainville 600–1200 m, rarely in lowlands; in Vanuatu sea-level to highlands; in Fiji, 110–840 m on Viti Levu (*graeffii*) but to 1200 m in SE Viti Levu (*optata*), and 350–1050 m on Taveuni.

**Food and Feeding.** Invertebrates, mainly insects and spiders (Araneae), occasionally fruit, rarely seeds. Large prey beaten before being consumed. Mainly arboreal, foraging in crown of trees or in shrubs in understorey, feeding in foliage and on branches, less often on ground. Foraging strata exploited, and methods employed, vary among habitats and localities; at some sites, differences between sexes. Extensive studies conducted at several sites in Australia. In rainforest in NE Queensland, 14.9% of foraging at 1–5 m (understorey), 31.3% at 5–10 m (subcanopy), 25.4% at 10–17.5 m (lower canopy), 25.4% at 17.5–25 m (upper canopy), 3% above 25 m (emergents); most foraging in foliage, twigs and small branches (80%), much less in branches (7.5%), trunks (3%), other vegetation (6%), air (4.5%); main technique gleaning (77.6%), with some sally-striking on vegetation (11.9%) and in air (9%). In wet eucalypt forest in S New South Wales most in lower levels, 2% below 0.2 m, 65% at 0.2–4 m (shrub layer), 16% at 4–10 m (subcanopy), 17% above 10 m (canopy); feeds mainly in foliage (67%), sometimes on branches (13%) and in air (10%), occasionally on trunks (5%), loose bark (3%) and ground (2%); much more reliant on sally-striking on vegetation (71%) than on gleaning (16%) or sally-striking in air (10%). In wet eucalypt in SW Western Australia generally similar, but more time on ground (6%) and branches (32%) and less in foliage (39%). In dry eucalypt forest in CE New South Wales, foraging on ground (2.8%), at 1–2 m (12%), 3–5 m (12.7%), 6–9 m (38.1%), 10–14 m (27.5%), above 15 m (6.9%); mainly in foliage and twigs (84.1%), also ground (2.3%), branches (9.4%), trunks (1.7%), air (2.4%); prey captured by gleaning (40.3%) and sally-striking on vegetation (57.4%), occasionally sally-striking in air (2.3%). In dry eucalypt woodland in SW Western Australia, in low open habitat, exploited all strata but increased time spent on ground (20%), with 12% at 0.2–1 m, 34% at 1.1–5 m, 34% above 5 m; feeds in foliage (52%), on branches (21%), ground (20%) and trunks (3%) and in air (1%), mainly by gleaning (56%) and sally-striking on vegetation (40%), rarely by probing (4%). Similar figures for mallee woodland in NE Victoria, although with somewhat greater time spent foraging on branches (30.7%). Seasonal shift in foraging substrates recorded at some sites: in Tasmania, foliage used 43% of time in summer and 83% in winter, branches 30% in summer and 11% in winter, air 24% in summer and 6% in winter. In Java and Bali, forages in middle and upper storeys, mainly by gleaning; on Guadalcanal forages along branches, looking into twigs and foliage, occasionally fluttering up rather clumsily; in Vanuatu in lower branches of canopy, subsage, undergrowth, occasionally ground, mainly gleaning, sometimes sally-striking in air. In Fiji, at one site mostly in middle zone, decreasing in numbers from lower zone to undergrowth to ground, at other site about equal proportions in middle and lower zones, with smaller and about comparable amounts in undergrowth and canopy, within level, feeds mainly in middle (branches), somewhat less in outer (foliage) and inner (near trunk), sallying (31%), gleaning (less than 10%), and most of time searching (c. 60%). At some sites, sexes feed mainly at different heights. In Australia, males above 5 m 90% of time and females below 5 m 77% of time in CE New South Wales; in SC Victoria, mean foraging height for males 11 m, for females 9 m; at other localities no obvious differences. Likewise, at some localities little difference between sexes in foraging methods employed, while elsewhere males use sally-

striking much more than do females, which mainly glean. In Solomon Is, males forage from substage to bottom of canopy, on San Cristobal often accompanied by females, whereas on Guadalcanal females skulk silently in undergrowth within c. 1 m of ground. In Fiji only males descend to lower strata, females and juveniles mainly in canopy. Joins mixed-species foraging flocks throughout range.

**Breeding.** Season Aug–Feb (mainly Sept–Oct) in Australia, eggs Sept–Oct on Lord Howe I, and at least Sept–Dec on Norfolk I; breeding condition in Nov–Dec in New Guinea; nests in Mar–Aug (most Apr–May) on Flores and active nest in Aug on Sumba; carrying nesting material in mid-Jul and fledgling seen in Nov on Guadalcanal (Solomons); Aug–Jan in Vanuatu; female in breeding condition in Aug and nestlings in late May on Uvea (Loyalty Is); Oct–Nov in Fiji. Following details refer to Australian races unless indicated otherwise. Forms pairs in breeding season, separate in non-breeding season; some indication that pair-bond retained at several localities, elsewhere little evidence. Territorial when breeding; singing contests with neighbours, particularly near joint boundaries. In courtship, male perches close to side of female, facing her, female tense and erect, wings outstretched, trembling, gently swaying, bill raised, male gradually moves from side of female to front and around to other side; also darts around female while calling. Nest built by female, with some assistance from male, a cup of twigs, plant stems, grass, needles, rootlets, bark, dead leaves, vines, occasionally wool or moss, bound externally with spider web, lined with grass, rootlets, bark, sometimes needles or hair, external diameter 8.9–15.2 cm, height 5.1–8.9 cm, internal diameter 5.1–7 cm, depth 3.2–5.1 cm; placed 0.5–9 m (usually c. 3 m) from ground in upright or vertical fork in thick outer foliage (providing overhead concealment) in shrub or small tree; territory size 0.8–4.5 ha. Clutch 2–3 eggs, white, pale cream or salmon, spotted and blotched with dark brown, reddish-brown or amber overlying dark grey and dull purple markings, often concentrated at large end, mean 23.8 × 17.3 mm (Australia), 23.9 × 17.8 mm (Lord Howe I), 26.2 × 18.4 mm (Norfolk I), 22 × 16–16.6 mm (Flores), 24 × 18 mm (Vanuatu); incubation by both sexes, period 15–16 days; both also brood and feed chicks, nestling period 10–12 days; fledglings tended by both parents. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*), Brush Cuckoo (*Cacomantis variolosus*) and Fan-tailed Cuckoo (*Cacomantis flabelliformis*). Hatching success in Australia 48.9–72.3 %. Maximum recorded longevity more than 18 years.

**Movements.** Not well known; tropical and island populations presumed to be sedentary. Some Australian populations present throughout year at some localities. Others migratory to varying degrees, much of movement altitudinal, shifting to more open habitats at lower elevations in non-breeding season; timing of movement may depend on age and sex, adult females and juveniles moving before adult males in some areas, whereas in others adult males may move while adult

females do not. In SE Queensland, departure from higher-lying breeding areas in Feb–Apr, returning Aug to early Oct. Of more than 3400 ringed individuals, 25% retrapped; 99.7% of these within 10 km of site of original capture. In Vanuatu, apparently wanders a great deal locally in non-breeding season.

**Status and Conservation.** Not globally threatened. Moderately common to common; locally very common. Races on Lord Howe I (*contempta*) and Norfolk I (*xanthoprocta*) both listed as “Vulnerable”, because their small ranges mean that they are potentially at risk of unforeseen catastrophe. Lord Howe race remains common, but restricted to c. 2000 breeding individuals in area of 12 km<sup>2</sup>. Norfolk I population only c. 1000 breeding birds in a range of 5 km<sup>2</sup>, and has in addition undergone steady decrease in numbers, already noted in 1960–1970s (although it still occupied about half of the island then); was further reduced through 1980s, with almost all of the 535 pairs restricted to Norfolk Island National Park. Most of the preferred habitat of *xanthoprocta* has been either lost or fragmented, and black rats (*Rattus rattus*), introduced in mid-1940s, may add predation pressure. A more recent study, in 1997, indicates that the decline has levelled out and numbers remain steady. Some other races, such as those restricted to small Indonesian islands, may prove to have similarly small populations; further fieldwork desirable.

**Bibliography.** Baker (1993), Barré & Dutson (2000), Barrett *et al.* (2003), Bell, B.D. (1990), Bell, H.L. (1986), van Bommel (1939), Bishop, K.D. & Brickell (1999), Bishop, Y. & Bishop (1972), Boles (1988), Bradley & Wolff (1958), Bregulla (1992), Bridges (1980), Brown & Brown (1994), Bruce (1978), Buckingham *et al.* (1990), Cain & Galbraith (1956), Campbell (1901), Chisholm (1916), Craig (2002), Crisp (1972), Dahl (1899), David & Gosselin (2002a), Diamond (1975, 1976, 2002), Disney (1976), Dongen (2006), Dongen & Mulder (2005), Dongen & Yocom (2005), Dutson (2007b), Farmer *et al.* (2004), Filardi *et al.* (1999), Ford, H.A. *et al.* (1986), Ford, J.R. (1971a), Frith (1984), Galbraith (1956, 1967, 1974b), Galbraith & Galbraith (1962), Gibbs (1996), Gilliard & LeCroy (1967a), Gorman (1975), Hadden (1981, 2004), Hartert (1896, 1904), Hartshorne (1953), Hellebrekers & Hoogerwerf (1966), Hemming (1956), Higgins & Peter (2002), Hindwood (1940b), Holmes & Recher (1986, 2000), Holyoak (1979), Howe (1932b), Hull (1909), Hutton, I. (1991), Johnstone & Storr (2004), Johnstone *et al.* (1996), Keast (1985), Kratter *et al.* (2001), Langham (1987, 1989), Lawrence (1952), Layard (1876a, 1876b), Layard & Layard (1878b), Legge (1908), Littler (1910), MacNally (2000), Marchant (1982), Mathews (1915, 1920d), Mayr (1931d, 1932a, 1932b, 1944b, 1954), Mayr & Diamond (2001), McCarthy (2006), Mees (2006), Milligan (1904b), North (1906), Noske (2003c), Paton (1986), Poulsen & Lambert (2000), Pratt *et al.* (1987), Rand (1942b), Recher & Holmes (2000), Recher *et al.* (1985), Rensch (1931), Robinson (1945), Rothschild & Hartert (1903a), Schodde (1977), Schodde & Mason (1999), Schodde *et al.* (1983), Serventy & Whittell (1976), Siebers (1930), Smith (1985), Smitthers & Disney (1969), Stattersfield & Capper (2000), Storr (1947), Tarburton (1992), Trainor (2007), Verheijen (1964), Wakelin (1968), Warner (1947), Watling (1982, 2001), Woinarski (1987), Wood & Wetmore (1926).



inches 3  
cm 8

# PLATE 34



## PLATE 34

### 30. New Caledonian Whistler

*Pachycephala caledonica*

French: Siffleur calédonien

Spanish: Silbador de Nueva Caledonia

German: Ockerhauch-Dickkopf

**Taxonomy.** *Muscicapa caledonica* J. F. Gmelin, 1789, New Caledonia.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. jacquinoti*, *P. flavifrons*, *P. melanura* and *P. aurea*. Sometimes regarded as conspecific with *P. pectoralis*; alternatively, some taxonomists expand present species to include whistlers of Loyalty Is, Banks Is, Vanuatu and Vanikoro (Santa Cruz Is), conventionally regarded as races of *P. pectoralis*. Monotypic.

**Distribution.** New Caledonia and I of Pines.



**Descriptive notes.** 14–16 cm; 18–25 g. Male has crown and side of head ashy grey, trace of yellow collar (often absent); upperparts and tail greenish-olive; upperwing dusky, remiges and wing-coverts edged greenish-olive, innermost secondaries with outer webs largely greenish-olive; chin and throat white, lateral throat feathers long, separating dull black breastband from ear-coverts, remainder of underparts dull yellow, centre of breast and upper belly strongly washed ochraceous, sides and flanks washed olive; iris dark brown; bill black; legs medium brown. Female has upperparts and upperwing olive-brown, tail greenish-olive; off-white below, breast and side of belly washed light greyish-brown, belly and thighs yellowish-white, undertail-coverts tinged yellow; legs light grey-brown. Immature is similar to female, but with prominent rufous markings on wing feathers. Voice. Song is a loud rising “whit-whit-whit”; also a repeated loud descending whistle. Sharp “chip” and two-note warble uttered by female during breeding period.

**Habitat.** Humid forest, including degraded forest and forest edge and, locally, drier forest; sea-level to mountains, to above 900 m.

**Food and Feeding.** Insects; occasionally small snails and seeds. Feeds in foliage and on branches.

**Breeding.** Season Dec–Jan. Nest a cup of fine twigs, unfixed, internal diameter 6.5 cm, some species web lined externally, attached to small twigs 1.5–10.5 m from ground. Clutch 2 eggs, white, blanchet and spotted with dark brown. Dates of incubation of eggs and rearing of young shared by parents; no information of duration of incubation and nesting periods.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in New Caledonia EBA. Quite common in suitable habitat, especially below 300 m. Occurs in Rivière Bleue Reserve.

**Bibliography.** Dutson (2007b), Galbraith (1956), Hannecart & Létocart (1980a), Layard & Layard (1882), Ross (1988), Warner (1947).

### 31. Tongan Whistler

*Pachycephala jacquinoti*

French: Siffleur des Tonga

German: Tongadickkopf

Spanish: Silbador de Tonga

**Taxonomy.** *Pachycephala jacquinoti* Bonaparte, 1850, Vava'u, Tonga.

Listed in some earlier texts as “*P. melanops*” on mistaken assumption that present scientific name was a nomen nudum. A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. flavifrons*, *P. melanura* and *P. aurea*. Often considered a race of *P. pectoralis*. Monotypic.

**Distribution.** Vava'u Group (‘Uta Vava’u, Kapa, Pangaimotu, ‘Euakafa, ‘Utungake, A’a) and Late I, in N Tonga.



**Descriptive notes.** 17–18.5 cm, 33–39 g. Male has head black, yellow collar on hindneck extending to side of breast; upperparts yellowish-olive, back and scapulars brighter than rump and uppertail-coverts; remiges blackish-brown, edged olive-green (finely so on primaries, narrowly on secondaries, broadly on tertials), wing-coverts sooty grey, edged and tipped olive-green; tail blackish-brown, bases and tips pale yellow; chin, throat and upper breast black, remainder of underparts yellow; iris dark brown; bill black; legs brown. Female has crown deep olive-grey, forehead, supercilium and postorbital area washed buff, ear-coverts cinnamon, hindneck-collar yellowish-olive, upperparts dull yellow-olive; remiges brownish-grey, primaries edged light grey-olive, secondaries and wing-coverts broadly edged dull yellow-olive, sometimes washed cinnamon; rectrices yellowish olive-grey, tipped pale yellow; upper throat white, many feathers often tipped blackish, lower throat whitish, strongly washed light cinnamon-buff, underparts pale yellow. Juvenile is predominantly rufous-cinnamon on body and on edges of secondaries and wing-coverts; first immature similar to adult female, but retains rufous-edged juvenile secondaries and wing-coverts, underparts much paler yellow, bill brown; second immature male like adult female, but back brighter olive, belly brighter yellow, wing-coverts edged olive, tail bright olive. Voice. Song of clear whistles with whiplash ending. Also noisy chatters.

**Habitat.** Dense primary broadleaf forest, sometimes adjacent secondary growth or submontane forest, occasionally in wooded plantations or early successional forest; rarely in open plantations. Avoids village areas.

**Food and Feeding.** Insects; occasionally small lizards; some fruit. Forages mainly in undergrowth, occasionally ascending to canopy of large trees.

**Breeding.** Season Jul–Sept; juveniles observed throughout year, may indicate absence of distinct breeding season. Territorial. Nest a cup of small twigs and rootlets, decorated externally with bits of leaves and sometimes spider web, usually unfixed, built 4–5 m from ground. Clutch 2 eggs, pale blue, with black blotching concentrated at larger end. No other information available.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Tonga Secondary Area. Common where it occurs; the most common passerine in larger tracts of forest. Only limited areas of suitable native forest remain, however, these primarily in very steep or inaccessible places, coastal littoral areas and swamps; total area occupied across all islands estimated at c. 130 km<sup>2</sup>. Introduced Pacific rat (*Rattus exulans*) and black rat (*Rattus rattus*) may also be predators on this whistler, and exotic ungulates overbrowse understorey of native vegetation.

**Bibliography.** Anon. (2006m), Butchart & Stattersfield (2004), Galbraith (1956), Gill (1990a), Mayr (1932b), Pratt *et al.* (1987), Rinke (1986, 1991a, 1991b), Rinke *et al.* (1992), Stattersfield & Capper (2000), Steadman & Freifeld (1998), Townsend & Wetmore (1919), Watling (1982, 2001).

32. Samoan Whistler  
*Pachycephala flavifrons*

**French:** Siffleur des Samoa      **German:** Diademdickkopf      **Spanish:** Silbador de Samoa

**Taxonomy.** *Eopsaltria flavifrons* Peale, 1848, Upolu, Samoa.  
A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. melanura* and *P. aurea*. Monotypic.

**Distribution.** Samoa: Savai'i, Upolu and Nu'utele.

**Descriptive notes.** 15–17 cm. Male head plumage varies considerably, with forehead and throat both yellow or both white, or forehead yellow and throat white, side of forehead yellow or white; top and side of head and upperparts dull black with olive tinge; upperwing and tail dull black, primaries narrowly edged light grey on outer webs; throat dull black, strongly mottled with yellow



or white, underparts yellow; iris dark brown; bill and legs black. Female is similar to male but duller, forehead and upperparts paler, throat pale grey. Juvenile is dark brown above and chestnut-brown below. **Voice.** Song a melodious series of whistles, "tweet-chew-tweet-titi-chew-wheel". Call a short whistle, "chweep"; female "chip chip chip"; alarm call a buzzing "churr".

**Habitat.** Primary and secondary forest, plantations and gardens; more common in unmodified forest than in partly logged forest. Sea level to high elevations; more numerous at lower altitudes.

**Food and Feeding.** Insects. Forages in middle storey, usually 2–10 m from ground, and in thick undergrowth along streams. Prey captured by gleaning from leaves, twigs, branches and epiphytes, or by sallying.

**Breeding.** Nest in late Mar and nearly fledged young in Aug. One nest placed 6 m from ground in fork of slender tree. Egg size 28.8–30 × 18.7–18.8 mm. No other information available.

**Movements.** Sedentary.

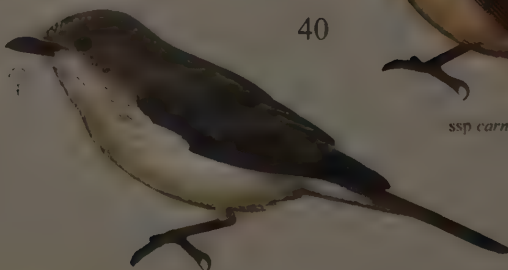
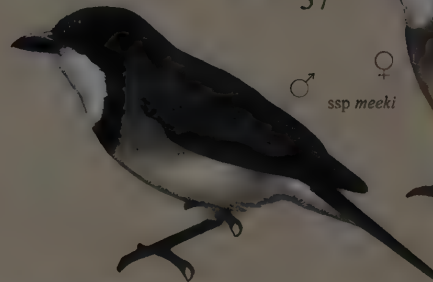
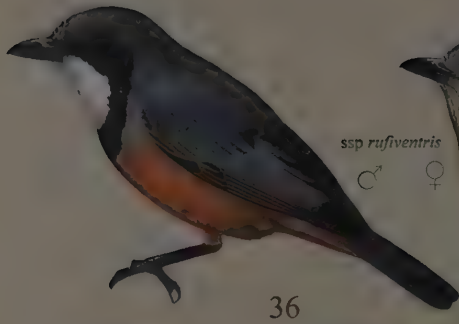
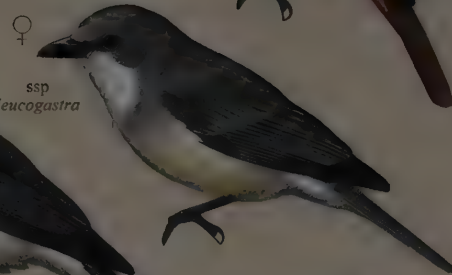
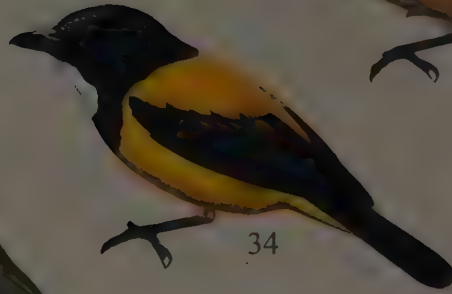
**Status and Conservation.** Not globally threatened. Restricted-range species; present in Samoan Islands EBA. Widely distributed on islands; common in lowland forest, occasional or rare in foothills and montane forest. Recently discovered to be present on the small island of Nu'utele, off

**Bibliography.** Dutson (2007b), Galbraith (1956), Hannecart & Létocart (1980a), Layard & Layard (1882), Ross (1988), Warner (1947).



inches 4  
cm 10

PLATE 35



33

34

35

37

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38

40

39

### 33. Black-tailed Whistler

#### *Pachycephala melanura*

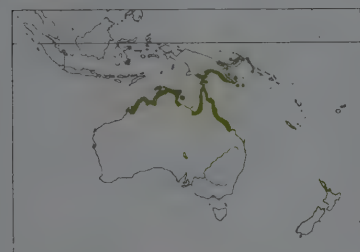
**French:** Siffleur à queue noire **German:** Mangrovedickkopf **Spanish:** Silbador Colinegro  
**Other common names:** Mangrove Golden Whistler, Black-tailed Thickhead; Robust Whistler (*spini-caudus*)

**Taxonomy.** *Pachycephala melanura* Gould, 1843, Derby, Western Australia.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons* and *P. aurea*. Previously treated as a race of *P. pectoralis*, but the two meet or overlap in range without interbreeding in NE Australia and most of Bismarck Archipelago; on other hand, apparent hybrid populations exist on islands E & S of Bougainville and probably on islands off E New Guinea. Race *whitneyi* may be closer to *P. pectoralis* or a hybrid. Races intergrade in Australia: proposed races *hilli* (NW Western Australia) and *violetae* (NW Northern Territory) are intergrades between nominate and *robusta*. Described taxon *hymae* (W Western Australia) is a synonym of *robusta*. Five subspecies recognized.

#### **Subspecies and Distribution.**

*P. m. melanura* Gould, 1843 – coasts of N & NW Western Australia (Kimberley and Pilbara).  
*P. m. robusta* Masters, 1876 – N Western Australia (from about Cambridge Gulf) E across coastal Northern Territory (including islands of Bathurst, Melville and Groote Eylandt) to N & NE Queensland (W & E sides of Cape York Peninsula, S on E coast to around Shoalwater Bay).  
*P. m. spini-caudus* (Pucheran, 1853) – S New Guinea (from Merauke E along coast to Hall Sound) and islands in Torres Strait.  
*P. m. dahl* Reichenow, 1897 – Bismarck Archipelago (Long I, Witu Is, Blanche Bay, islands in Bungula Bay, Duke of York Is, Talele, Uatom, Palikuru Is, Nusa, Malie, Nissau I) and SE New Guinea coast E from Hall Sound, including Fergusson I and other islands off tip.  
*P. m. whitneyi* E. J. O. Hartert, 1929 – Whitney, Momalufu and Akiri (W of Shortland I), in extreme NW Solomon Is.



**Descriptive notes.** 15–17 cm; 19–26 g. Male nominate race has top and side of head and nape black, yellow collar on hindneck extending to side of breast; upperparts yellow-olive, slightly paler on rump and uppertail-coverts; remiges sooty black, edged grey on outer webs (finely so on primaries, narrowly on secondaries, broadly on tertiaries), upperwing-coverts sooty grey, edged and tipped olive-yellow; tail black, edges of basal half of rectrices washed yellowish; chin and throat white, narrow black upper breastband extending to side of hindneck, remainder of underparts yellow, flanks tinged olive, thighs brownish-grey with dull yellow

feather tips; iris dark red; bill black; legs grey-black to black. Female has forehead, crown and nape grey, sides of head and neck and hindneck pale grey-brown, mantle, back and rump grey, uppertail-coverts dull olive; remiges grey-black with pale grey edging (pale grey increasing in extent from primaries to tertiaries), primary coverts dark grey and secondary coverts pale grey, both edged paler, tail greyish-brown, bases of rectrices edged olive; chin and throat off-white with faint grey-brown barring, breast and flanks light grey-brown, belly off-white to cream, crissum and undertail-coverts yellow. Juvenile is extensively rufous; first immature like adult female, but retains juvenile rufous-edged remiges and rufous secondary coverts; second immature male can resemble adult male or adult female, or have mixture of both. Race *robusta* male has hindneck-collar and breastband broader, back and wings brighter, rectrices (including base) black, narrowly tipped olive-grey, thighs black with yellow tips, female upperparts olive, upper breast light grey-brown, rest of underparts yellow; *spini-caudus* is like previous, but female crown and breast browner, chin and throat more boldly marked; *dahl* is like last, but female throat and breast with dark shaft streaks and underparts much brighter yellow; *whitneyi* male variable, has chin and throat white with or without yellow wash, or chin whitish and remainder yellow, underparts orange, or yellow, or yellow with orange wash, back and rump olive-green, uppertail-coverts with black centres, female crown tinged grey, breast vinaceous grey with grey streaks, belly to undertail-coverts pale yellow with light grey streaks, flanks washed grey-brown. **VOICE:** Song in SE New Guinea a mix of sweet and harsh notes, each sequence ending with sharp whip-like note; in Australia a loud melodious whistle, often ending in crack-like note, “chee-chee-tchee-tchee-tu-wit”. Contact call “wheep”.

**Habitat.** Mainly in mangroves, occasionally other closed coastal habitats; on islands, also in more open habitats. Found at sea-level. In New Guinea mangroves, locally reedbeds, woodland along subcoastal freshwater swamps, bamboo stands near fresh water, dense groves of partly inundated paperbarks (*Melaleuca*) on subcoastal lagoons; on islands also coastal forest, coastal scrub, disturbed areas, secondary growth. In Australia mangroves, usually with closed canopy, occasionally other closed coastal habitats such as monsoon scrub, vine thickets and acacia (*Acacia*) thickets; on islands, also open eucalypt (*Eucalyptus*) forest, stunted open heathland and paperbark thickets.

**Food and Feeding.** Invertebrates, mainly insects, also spiders (Araneae), small crabs. Forages mainly in middle levels of vegetation up to canopy; sometimes down to within 1–2 m of ground, rarely on ground. Feeds mainly in foliage and branches, occasionally on mangrove roots. Techniques are gleaning and sally-striking.

**Breeding.** In Australia, season Oct–Feb in Western Australia, eggs mid-Jan in Northern Territory, and eggs in Jun, Sept and Dec in Queensland. Territorial. Nest a thinly constructed cup of grass, rootlets and twigs, bound externally with spider web, lined with fine twigs, rootlets and grass, external diameter 7–10 cm, height 6–9 cm, internal diameter 5–6 cm, depth 3–3.8 cm; placed 1.6–3 m from ground in vertical fork or on horizontal branch among mangrove leaves or in thick vines. Eggs 2–3, creamy buff or light yellowish-buff, spotted and blotched dark brown, dark olive and sooty brown, with underlying dark grey marks, concentrated at larger end, in Australia 20.8–22.4 × 16.5–16.8 mm, in New Guinea (race *dahl*) 20–25 × 17–18.5 mm; no information on incubation and nestling periods; both adults feed young.

**Movements.** Apparently sedentary; immatures may wander from mangroves. All recoveries of marked individuals less than 10 km from site of original ringing. Presence on many small islands indicates ability to disperse across water.

**Status and Conservation.** Not globally threatened. Locally common in New Guinea. Widespread and fairly common in Australia, but rather patchily distributed in some regions.

**Bibliography.** Bailey (1992), Barrett *et al.* (2003), Boles (1988), Campbell (1901), Carter (1903b), Coates (1990), Dahl (1899), David & Gosse (2002a), Diamond (1976), Dutton (2007b), Eys (1983), Ford (1982, 1983b), Galbraith (1956, 1967, 1974b), Hadden (2004), Hall (1902), Hartert (1926), Higgins & Peter (2002), Howell (1981), Iredale (1956), Johnstone (1990), Johnstone & Storr (2004), Mathews (1920d), Mayr (1954), Mayr & Diamond (2001), McCarthy (2006), North (1906), Reichenow (1899), Rothschild & Hartert (1903a), Schodde & Mason (1999).

### 34. Golden-backed Whistler

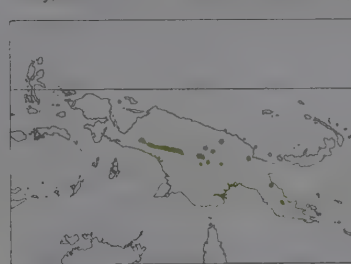
#### *Pachycephala aurea*

**French:** Siffleur à cape jaune **German:** Gelbrücken-Dickkopf **Spanish:** Silbador Áureo  
**Other common names:** Golden-yellow/Yellow-backed Whistler

**Taxonomy.** *Pachycephala aurea* Reichenow, 1899, Ramu River, New Guinea.

A member of a species group that includes also *P. orpheus*, *P. nudigula*, *P. meyeri*, *P. soror*, *P. lorentzi*, *P. schlegelii*, *P. implicata*, *P. pectoralis*, *P. caledonica*, *P. jacquinoti*, *P. flavifrons* and *P. melanura*. Monotypic.

**Distribution.** New Guinea at scattered localities from Weyland Mts and S slopes of Snow Mts E to upper R Fly, Ok Tedi, Telefomin, R Nomad, middle R Sepik, upper R Ramu, L Kapiago, Nembi Valley, and a few localities in mountains of SE (including Garaina and Naoro).



**Descriptive notes.** 15–17 cm. Has crown, side of head and neck black, back, rump and uppertail-coverts yellow, upperwing and tail black; chin and side of throat black, centre of throat white, broad black breastband, remainder of underparts yellow; iris brown; bill black; legs dark grey. Sexes alike. Immature is similar to adult, but feathers of crown edged olive, upperparts yellow with olive wash. **VOICE:** Musical whistles of steeply modulated pitch, often with explosive finish. “wheet-wheet-wheet-whichew”, “wheet-whot-wheet”, “chee-chiw”, “chiw-wheet”.

**Habitat.** Secondary growth, shrubs, tall canegrass or other vegetation fringing rivers or lakes, mixture of bushes and reedbeds; occasionally in *Albizia* trees in tea plantations. Sea-level to 700 m; occasionally higher, to 1300 m at L Kapiago and 1460 m in Nembi Valley.

**Food and Feeding.** Insects. Forages mainly at 3–7 m, sometimes higher or lower; behaviour reportedly as that of *P. pectoralis*.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to very common. Distribution very patchy.

**Bibliography.** Beehler *et al.* (1994), Bell (1970b), Coates (1990), Gregory (1995b), Iredale (1956), Ogilvie-Grant (1915), Rand & Gilliard (1967), Rothschild & Hartert (1903a).

### 35. Drab Whistler

#### *Pachycephala griseonota*

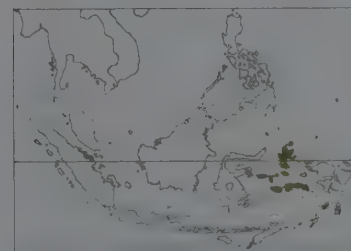
**French:** Siffleur terne **German:** Molukkendickkopf **Spanish:** Silbador Cenizo

**Taxonomy.** *Pachycephala griseonota* G. R. Gray, 1862, Seram, Moluccas.

Forms a superspecies with *P. rufiventris*, *P. leucogastra*, *P. monacha* and *P. arcitorquis*. Sometimes treated as a race of *P. rufiventris*. Race *johni* occasionally regarded as a separate species. Six subspecies recognized.

#### **Subspecies and Distribution.**

*P. g. cinerascens* Salvadori, 1878 – Morotai, Halmahera, Bacan, Ternate and Tidore.  
*P. g. lineolata* Wallace, 1863 – Sula Is (Scho, Taliabu, Sulabesi).  
*P. g. johni* E. J. O. Hartert, 1903 – Obi.  
*P. g. examinata* E. J. O. Hartert, 1898 – Buru.  
*P. g. griseonota* G. R. Gray, 1862 – Seram.  
*P. g. kuehni* E. J. O. Hartert, 1898 – Kai Is (Kai Kecil, Tual, Kai Besar).



**Descriptive notes.** 14–15.5 cm. Male nominate race has forehead, crown and side of head sooty grey, upperparts greyish-brown, upperwing and tail dusky grey-brown; chin and throat off-white, breast greyish-ochre, belly rusty ochre; iris dark reddish-brown; bill black; legs black to leaden grey. Female is similar to male, but more uniformly coloured. Immature resembles female. Race *kuehni* is similar to nominate, but throat tinged grey, breast much duller grey-brown, belly paler buffy ochre, female breast with dark shaft streaks. *examinata* has crown dark slaty blue, throat white, breast light grey, belly buffy-ochre; *lineolata* is like

previous, but back greyer, less brownish, contrasting less with crown, breast grey, belly white; *cinerascens* has back browner than last, breast darker and more ashy, belly white with slight tinge of ochre; *johni* has upperparts more olive-brown, strongly contrasting with crown, underparts uniform rusty cinnamon, female throat and breast streaked black. **VOICE:** Song on Seram (nominate race) a loud, prolonged, cheery warble lasting c. 15 seconds; on Halmahera (*cinerascens*) 10–12 notes at moderate volume and pitch that swell and slightly accelerate, finishing with rather weak “tu-wit”; on Kai Kecil (*kuehni*) variable in volume, pitch and phrases, commonest version 4–5 loud, ringing notes ending with slightly explosive double note, sometimes a series of 6 loud staccato notes with explosive finish, “kwik kwik kwik kwik kwik kwik”.

**Habitat.** Primary and tall secondary forest, avoiding densest parts; also dry forest, selectively logged forest (Bacan), scrub (Buru) and lightly wooded cultivation (Kai Kecil); avoids mangroves.



Lowlands and hills, on Halmahera to 655 m and on Seram to 1100 m (absent from coast on both islands); 280–1200 m on Bacan, 220–700 m on Obi, c. 500–1300 m on Buru, 0–400 m on Kai Besar; confined to lowlands in Sula Is (Taliabu).

**Food and Feeding.** Insects. Forages from understorey up to canopy. Sometimes in mixed-species foraging flocks (Bacan, Obi, Kai Kecil).

**Breeding.** Juvenile in mid Sept. No other information available.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Banda Sea Island, FBA, Hangean and Sula Islands (BA, Buru I-BA, Seram FBA and Northern Maluku FBA), Common on Taliabu, Sula Is; locally moderately common on Halmahera, but generally uncommon on Bacan; common on Obi; uncommon on Buru and Seram; moderately common on Kai Kecil, but uncommon on Kai Besar.

**Imaging.** Hewitt & Taylor (1989), Coates & Bishop (1997), Harten (1993a, 1993b), Lambert (1994), Marsden *et al.* (1997), Meyer & Wieglesworth (1998b), Poulsen & Lambert (2000), Salvadori (1876b, 1881), Siebers (1930), White & Bruce (1986).

## 36. Rufous Whistler

### *Pachycephala rufiventris*

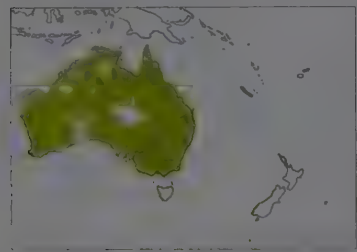
**French:** Siffleur ichtong **German:** Schlichtmantel-Dickkopf **Spanish:** Silbador Rufo  
**Other common names:** Rufous-breasted Whistler, Pale-breasted/Rufous-breasted/Northern Thick-head

**Taxonomy.** *Sylvia rufiventris* Latham, 1801, Sydney, New South Wales, Australia.

Forms a superspecies with *P. griseonota*, *P. leucogastra*, *P. monacha* and *P. arctitorquis*; some or all of these sometimes treated as races of present species. Nominative race, *falcata* and *pallida* broadly intergrade where they meet in Australia; described races *colletti* (from Kimberley I. in interior Northern Territory to Gulf of Carpentaria) and *dulcor* (N Queensland) considered intermediates, included under, respectively, *falcata* and *pallida*. Also, paler birds in C Australia sometimes separated as race *maudeae*, but pale coloration probably linked to hot climate and arid habitat in which they live; included with nominate. Five subspecies recognized.

**Subspecies and Distribution.**

- P. r. minor* Zietz, 1914 – Bathurst I and Melville I, off Northern Territory (N Australia).
- P. r. falcata* Gould, 1843 – NW Western Australia (Kimberley area) and N third of Northern Territory.
- P. r. pallida* E. P. Ramsay, 1878 – NE Australia (Cape York Peninsula and NW Queensland).
- P. r. rufiventris* (Latham, 1801) – S four-fifths of mainland Australia.
- P. r. xantheraea* (J. R. Forster, 1844) – New Caledonia.



**Descriptive notes.** 16–18 cm; 20–27 g. Male nominate race has top of head, side of neck and upperparts grey; broad black stripe from lores through face to ear-coverts, then along side of throat to breast, enclosing white chin, throat and malar area, remiges blackish-brown, edged pale grey on outer webs (finely so on primaries, narrowly on secondaries, broadly on tertiaries), primary coverts dark grey, narrowly edged grey, secondary coverts sooty grey, edged and tipped pale grey; central pair of tail feathers grey with blackish subterminal spot, other rectrices black, edged grey; underparts below breastband rufous, side of upper breast

light grey; iris dark reddish-brown; bill black; legs grey-black to black. Female has top and side of head, and hindneck to back brownish-grey, grading into grey on rump and uppertail-coverts; wing as male but slightly browner, tail as male; chin, throat and malar area off-white to buff-white with fine streaking, breast, belly and flanks cream to buff with fine blackish-brown streaks, breast side and flanks sometimes washed dull rufous, crissum and undertail-coverts off-white to cream; bill black when breeding, light brown at other times. Juvenile is dark brown with narrow buff shaft streaks above, secondaries, tertiaries and wing-coverts edged buff, underparts white, heavily streaked dark brown, iris dark brown, bill yellow-brown, gape yellow; first immature like adult female, but underparts more heavily streaked, retains juvenile rufous, secondaries and median coverts and rectrices; second immature male as adult female. Race *falcata* male lacks black eyestripe, has lores through orbit to ear-coverts dark grey, side of neck dark grey, usually separating grey of ear-coverts from black of breastband; *pallida* is similar to previous, but male paler, particularly on underparts, female lacks streaks on belly and flanks; *minor* male has heavier black streaks on crown, breastband extending to side of neck, female upperparts darker and more male-like than in other females, streaking on underparts reduced; *xantheraea* is like nominate, but male eyestripe reduced and considerably lighter (lores, ear-coverts and side of neck dark grey). Voice. Complex song, noisy, diverse, with varying rhythm, comprising many song phrases in multiple combinations, includes “joey joey joey joey...” repeated up to 30 times, usually male to female; “Slow song” a lower, purer modification of song; “Whisper song”, given during courtship between sexes, softer versions of song; “Simple song” an explosive “ee-chong” or “ee-chong-chik”, usually male to male; “Trill” a rapidly repeated “pee-pee-pee-pee...”; also a loud “whit”. Both sexes sing, with same repertoire (except for trill, not given by female); sexes duet, alternately giving same call. In conversational song, two birds contribute parts to running song so closely that hard to distinguish contribution of each. Noted for reacting to loud noise with bouts of loud singing. In New Caledonia (race *xantheraea*), loud ringing “joey joey joey” ending with whistler-like “ee-chong”.

**Habitat.** In Australia mainly in dry eucalypt (Eucalyptus) forest and woodland, usually with patchy understorey, also riparian associations, mixed forest and woodland, cypress pine (Callitris) and casuarina (Casuarina) woodland, mulga and other acacia (Acacia) woodland and shrublands, paperbark (Melaleuca) thickets, semi-arid mallee; occasionally mangroves, moist or even wet eucalypt forest, and pine plantations more than 10 years old, rarely in temperate or dry rainforest, from sea-level to highland. In New Caledonia open forest, disturbed areas, savanna grassland with scattered trees, garden, roadsides, mainly at lower elevations, to 450 m.

**Food and Feeding.** Arthropods, mainly insects; also seeds, fruit, occasionally leaves. Mainly arboreal, feeding mainly in sunlit canopy and canopy, usually at higher level than other Australian whistlers. Sexes feed together in foraging teams; methods and sites, female lower, often near ground. In open forest and woodland (Northern Territory), some shift between dry and wet seasons, foraging on ground (6% in dry and 0% in wet), 0–1 m (5%, 17%), 2–3 m (11%, 17%), 4–7 m (32%, 32%), 8–14 m (1%, 18%), above 14 m (10%, 9%). In dry eucalypt forest (C New South Wales) 3% of foraging on ground, 12% at 1–2 m, 9% at 3–5 m, 25% at 6–9 m, 40% at 10–14 m, 10% above 15 m; in tall eucalypt forest (S New South Wales) 3% on ground (0–2 m), 20% in shrub (0–2–4 m), 47% in subcanopy (4–10 m), 30% in canopy (above 10 m); in low open woodland (SW

Western Australia) 61% at 0–0.1 m, 0% at 0.2–1 m, 26% at 1–1.5 m, 13% above 5 m. Feeds mainly in foliage (43–83%) and, to lesser degree, branches (6–30%); other feeding preferences quite variable, e.g. trunks 0–10%, ground 0–6%, air 0–14%. Also differences between study sites in preferences of sexes; at some localities little difference evident, at others male in foliage more than female, and latter may concentrate more on bark surfaces. Gleaning and sally-striking on vegetation most important methods of prey capture, but proportions may differ markedly among sites; gleaning 19–20% and sally-striking 61–76% at some localities, at others gleaning 72% and sally-striking 22%. Sally-striking on air 1–16%. At many (but not all) locations, males glean less than do females, spending more time sally-striking. In New Caledonia forages in scrub, brush along streambanks and roads, and mangrove heath. Joins mixed-species foraging flocks.

**Breeding.** Eggs in Jul–Mar (most Oct–Nov) in Australia, and often two (occasionally three) clutches in a season, new clutch started 7–16 days after preceding brood fledges; Nov–Jan in New Caledonia. Following data refer to Australian races unless otherwise indicated. Breeds as simple pair; mate-fidelity high (even in migratory populations) throughout and between years. Non-migratory pairs defend territory throughout year; among migratory populations, male re-establishes territory upon arrival at breeding grounds. In courtship display, female squats with wings quivering, feathers somewhat fluffed, while male perches nearby, facing her, and rocks back and forth while pointing head upwards, wings partly lowered and spread and tail partly fanned and cocked; male may maintain this for several minutes, often followed by copulation or pursuit-flight. Nest built by female, work taking 2–10 days (mean c. 7 days), a cup of twigs, grass, tendrils, rootlets and needles, sometimes unlined, otherwise lined with grass, rootlets and fibres, often bound externally with spider web, external diameter 7–10.2 cm, height 5–6.4 cm, internal diameter 5.1–6.4 cm, depth 3.2–3.8 cm (in New Caledonia, diameter 5–6 cm, depth 3–4 cm); placed 0.8–27 m (usually 4.5–9 m; in New Caledonia 0.3–1.5 m) from ground in upright fork in outer foliage, occasionally in vine tangle or mistletoe (Loranthaceae); territory 1.2–4.2 ha. Clutch 2–3 eggs, occasionally 4, pale or dull olive or olive-brown, with dark brown and grey spots or blotches and underlying markings of same colour, sometimes concentrated in wreath near larger end, 19–23.4 × 16–17.8 mm; incubation by both sexes, period 13–16 days; both parents brood and feed chicks, nestling period 10–12 days; oldest one or two fledglings cared for by female, remainder tended by male, young remain in territory for up to 8 weeks before migrating, those of non-migratory populations until start of next breeding season. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Hatching success 50–70% and fledging rate 0.59–1.12 young per breeding pair per season; eggs and young preyed on by Grey-crowned Babbler (*Pomatostomus temporalis*), Laughing Kookaburra (*Dacelo novaeguineae*), Pied Currawong (*Sirepera graculina*), and *Colluricincla harmonica*. May breed in second year. Maximum recorded longevity 15 years 2 months.

**Movements.** Sedentary in New Caledonia. In Australia, apparently resident in inland areas and N parts of range, and partly migratory in E; movements complex and not well understood. In SE mainland some leave breeding grounds, as judged by correlated changes in abundance; departure N in Aug–Sept, return S late Feb–Apr (Queensland) or Apr–May (New South Wales, Victoria); extent of movements uncertain. Migratory birds return to same or neighbouring territory in successive years; males arrive at breeding grounds c. 3–3.5 days before females, adults generally arrive before immatures. Local movements occur in non-breeding season.

**Status and Conservation.** Not globally threatened. Common throughout Australian range; fairly common in New Caledonia. Has declined in some areas of Australia as a result of extensive clearance of habitat; increases noted in other areas, where wooded habitat has been opened up.

**Bibliography.** Barré & Dutton (2000), Barrett *et al.* (2003), Bell & Ford (1987), Boles (1988, 1990), Bourke (1947), Bridges (1980, 1994a, 1994b), Brooker, Braithwaite & Esterges (1990), Campbell (1901), Chisholm (1916), Deignan (1964), Erickson (1949, 1950a, 1950b, 1951a, 1951b), Farmer *et al.* (2004), Ford *et al.* (1986), Galbraith (1974b), Gilbert (1935), Hall (1902), Hannecart & Létocart (1980a), Higgins & Peter (2002), Hill (1911), Holmes & Recher (1986, 2000), Jack (1949), Johnstone & Storr (2004), Keast (1985, 1993, 1994a, 1994b), Lane (1968), Layard & Layard (1882), MacNally (2000), Mathews (1920d), Mayr (1954), McCarthy (2006), McDonald (2001), McDonald *et al.* (2001), Milligan (1905), North (1906), Recher & Davis (1997, 1998), Recher & Holmes (1985, 2000), Recher *et al.* (1985), Rix (1976), Robinson (1945), Salter (1958), Schodde & Mason (1999), Serventy & Whittell (1976), Shields & Recher (1984), Smith (1985), Warner (1947), Whitlock (1922), Wieneke (2003), Woinarski (1987).

## 37. White-bellied Whistler

### *Pachycephala leucogastra*

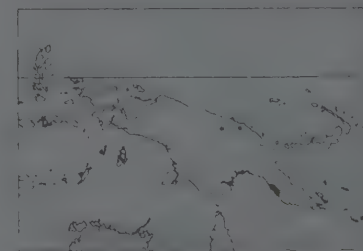
**French:** Siffleur à ventre blanc **German:** Weißbauch-Dickkopf **Spanish:** Silbador Ventri blanco  
**Other common names:** Rossel Island Whistler (*meeki*)

**Taxonomy.** *Pachycephala leucogastra* Salvadori & D'Alberty, 1875, Mount Epa, south-east New Guinea.

Forms a superspecies with *P. griseonota*, *P. rufiventris*, *P. monacha* and *P. arctitorquis*. Sometimes regarded as conspecific with one more of these; hybridizes with *P. monacha* on Sogeri Plateau and in R Angabunga area (from Bereina to Mafulu). In NE New Guinea, whistlers with white belly and white throat, apparently of this species, reported from Wewak and Lumi, foothills of C North Coastal Range and East Sepik Province, but racial affiliation of these not known; further study required. Two subspecies recognized.

**Subspecies and Distribution.**

- P. l. leucogastra* Salvadori & D'Alberty, 1875 – coastal SE New Guinea from Hall Sound SE to Port Moresby.
- P. l. meeki* E. J. O. Hartert, 1898 – Louisiade Archipelago (Rossel I), off SE New Guinea.



**Descriptive notes.** 14–15 cm; 21–24 g. Male nominate race has crown, side of head, hindneck and broad band on upper breast black, enclosing white chin and throat; upperparts brownish-grey to grey, upperwing and tail dark brown; underparts below breastband white, with or without grey sides; iris red-brown; bill black, legs slate-coloured. Female has upperparts and head side dark grey, wings and tail dark brown, throat white or whitish with very fine black shaft streaks, breastband grey with fine blackish streaks, rest of underparts white, tinged buffy or creamy. Juvenile is grey above, with rufous patches on head, back and uppertail-coverts, has greater wing-coverts rufous and secondaries largely rufous, throat pale grey; becoming pale buff on underparts, grey streaks on throat and breast, bill dark brown, paler on lower mandible, legs dark grey, immature resembles adult female but slightly browner, more dis-



tinctly streaked on throat and breast, and with distinct white eyering. Race *meeki* has upperparts much darker than nominate, more blackish, tail black, breast side grey. **Voice.** Song a series of notes with explosive finish, "chéw"; also varied phrases that often end with "see-see-see-see", increasing in volume. Also loud "eee-chóng".

**Habitat.** Wetter eucalypt (*Eucalyptus*) savanna in hills, also mangroves, ecologically disturbed habitats, rubber plantations, and taller trees near water in lowland savanna; occurs from sea-level up to c. 1200 m.

**Food and Feeding.** Insects. Forages in upper tree levels.

**Breeding.** Individual with nesting material in early Feb, nest under construction in early Jun, also adult attending nest and adults feeding young, both in early Jun, indicative of breeding during wet season and possibly also in early dry season, at least. Nest a cup of vegetable material, placed in tree fork usually 10–20 m up in disturbed habitats, but as low as 2 m above water on edge of mangroves. No information on clutch size and eggs; one nest contained two young.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in North Papuan Lowlands EBA, Louisiade Archipelago EBA and South-east Papuan Lowlands Secondary Area. Generally scarce and local, but patchily common. Abundant in wetter eucalypt savannas.

**Bibliography.** Bell (1984e), Coates (1990), David & Gosselin (2002a), Finch (1983), Iredale (1956), Mayr & Gilliard (1954), McCarthy (2006), Rand & Gilliard (1967), Salvadori & D'Albertis (1875), Stresemann (1924).

## 38. Black-headed Whistler

### *Pachycephala monacha*

**French:** Siffleur moine **German:** Arudickkopf **Spanish:** Silbador Monje  
**Other common names:** Black-backed Whistler

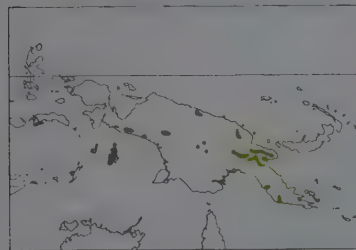
**Taxonomy.** *Pachycephala* ? *monacha* G. R. Gray, 1858, Aru Islands.

Forms a superspecies with *P. griseonota*, *P. rufiventris*, *P. leucogastra* and *P. arctitorquis*. Sometimes treated as conspecific with last three of these; in SE New Guinea, hybridizes with *P. leucogastra* on Sogeri Plateau and in R Angabunga area (from Bereina to Mafulu). Race *lugubris* commonly referred to as *dorsalis*, but former name has priority. Two subspecies recognized.

**Subspecies and Distribution.**

*P. m. monacha* G. R. Gray, 1858 – Aru Is, off SW New Guinea.

*P. m. lugubris* Salvadori, 1878 – patchily in New Guinea mountains from Charles Louis Mts, mouth of R Mimika and R Utanata, Snow and Victor Emanuel Ranges, and N base of Bewani Mts, R Puwani and Saruwaged Mts E to Owen Stanley Mts.



**Descriptive notes.** 15–16 cm; 24–28 g. Male nominate race has head and neck black, upperparts brownish-black, rump somewhat paler and greyer; upwings and tail brownish-black, remiges and wing-coverts edged pale grey on outer webs; chin, throat and upper breast black, remainder of underparts white; iris dark brown; bill black; legs dark grey or black. Female has body largely blackish-grey, throat and lower breast slightly paler, belly white. Probably at least two immature plumages, at least for males; first immature much browner, with underparts streaked. Race *lugubris* has upperparts blacker than nominate.

**Voice.** Song a series of whistled notes varying in speed and volume, ending in loud, explosive note, e.g. "wis-wis-wis-wis-wis-chew!", "wi-whi-whi-whi-chúwip" or "wheeee-whip!". Range of other phrases and variations given in changing combinations.

**Habitat.** Forest edges and ecologically disturbed areas, such as plantations, gardens, villages, and groves of tall trees, especially casuarinas (*Casuarina*), in cleared areas; at 550–1980 m, mainly above 1000 m, locally in lowlands (R Mimika River, N base of Bewani Mts).

**Food and Feeding.** Insects, including caterpillars. Forages in upper and middle levels. Prey captured mainly by gleaning from twigs and leaves, occasionally by sallying.

**Breeding.** Nest under construction in mid-Oct, and nest with incubating female in mid-Jun. Nest a substantial cup of plant material, placed 6–25 m from ground in fork of branch. No other information.

**Movements.** Many populations presumably sedentary, although this species' distribution appears to be expanding.

**Status and Conservation.** Not globally threatened. Common and widespread in Western Highlands, Chimbu and Eastern Highlands Provinces of New Guinea, where it appears to be expanding its range by colonizing cultivated areas; very local and scarce elsewhere. No information on status in Aru Is.

**Bibliography.** Bell (1984e), Coates (1990), Diamond (1972), Gyldenstolpe (1955a), Iredale (1956), King (1979), Mayr & Gilliard (1954), McCarthy (2006), Mees (1994), Rand & Gilliard (1967), Stresemann (1924), Tolhurst (1991), Watson *et al.* (1962).

## 39. Wallacean Whistler

### *Pachycephala arctitorquis*

**French:** Siffleur de Wallace **German:** Weißhals-Dickkopf **Spanish:** Silbador de la Wallacea  
**Other common names:** White-bellied Whistler

**Taxonomy.** *Pachycephala arctitorquis* P. L. Sclater, 1883, Larat, Tanimbar Islands.

Forms a superspecies with *P. griseonota*, *P. rufiventris*, *P. leucogastra* and *P. monacha*. Sometimes treated as conspecific with *P. rufiventris* and/or *P. leucogastra* and *P. monacha*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. a. kebirensis* A. B. Meyer, 1884 – E Lesser Sunda Is (Roma, Damar, Moa, Babar).

*P. a. arctitorquis* P. L. Sclater, 1883 – Tanimbar Is (Yamdena, Larat, Lutu, Mutu).

*P. a. tianduana* E. J. O. Hartert, 1901 – Tayandu Is (Tayandu).

**Descriptive notes.** 14 cm. Male nominate race has crown, side of head and hindneck black, upperparts grey, upwings and tail dark brown; white below, except for black band on upper breast, sides sometimes washed grey; iris red-brown; bill black; legs slate-grey. Female has upperparts pale rusty brown, crown more cinnamon, throat whitish, rest of underparts rusty cream, darkest on breast and flanks, lower throat and breast with fine dark streaking. Juvenile like female, but rectrices and upwings-coverts with extensive rufous edging; first immature much browner than adult female.



swelling towards end. Range of other phrases and variations given in changing combinations.

**Habitat.** Mangroves, forest, forest edges and ecologically disturbed areas, such as plantations, gardens and villages.

**Food and Feeding.** Insects. Forages in upper and middle levels. Prey captured mainly by gleaning.

**Breeding.** No information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Common on Yamdena. Status of populations on other islands of range uncertain; suggested that large number of specimens collected on some of these islands during 19th century could perhaps indicate that it was, at least at that time, reasonably common.

**Bibliography.** Bishop & Brickle (1999), Coates & Bishop (1997), Forbes (1884), Hartert (1903a, 1904), Sclater (1883a), Stresemann (1924), Trainor (2007), White & Bruce (1986).

## 40. White-breasted Whistler

### *Pachycephala lanioides*

**French:** Siffleur à bavette blanche **German:** Weißbrust-Dickkopf **Spanish:** Silbador Pechiblanco  
**Other common names:** White-bellied Whistler(?), White-bellied/Shrike-like Thickhead

**Taxonomy.** *Pachycephala lanioides* Gould, 1840, Derby, Western Australia, Australia.

Part of a species group that also includes the superspecies *P. griseonota*, *P. rufiventris*, *P. leucogastra*, *P. monacha* and *P. arctitorquis*. Birds from R De Grey area of Western Australia coast described as race *bulleri*, but considered inseparable from *carnarvoni*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. l. lanioides* Gould, 1840 – N Western Australia (coast of W Kimberley from S of Admiralty Gulf S to Eighty Mile Beach).

*P. l. carnarvoni* (Mathews, 1913) – Pilbara coast from Eighty Mile Beach S to Carnarvon, in NW Western Australia.

*P. l. fretorum* De Vis, 1889 – extreme NE Western Australia (Cambridge Gulf) and coast of Northern Territory (including islands of Bathurst, Melville and Groote Eylandt) E to SW Cape York Peninsula (NW Queensland).



**Descriptive notes.** 18–20 cm; 38–44 g. Male nominate race has top and side of head black, broad chestnut hindneck-collar extending down side of neck to join breastband; mantle to rump dark grey, upperside-coverts black; remiges blackish-brown, edged pale grey on outer webs and tips, wing-coverts sooty black, tipped grey, tail black with narrow pale grey tip; chin and throat white, bordered by black band on upper breast, then chestnut band on lower breast (joining collar); rest of underparts white, outer thighs brownish-grey; iris dark red-brown; bill black; legs sooty black. Female has top and side of head and neck brownish-

grey, crown and nape narrowly streaked blackish-brown, face slightly browner than crown, lores white, mottled pale brown, narrow white eyering; upperparts, including wing, brownish-grey, remiges and wing-coverts edged and tipped pale grey; tail blackish-brown, rectrices edged light brownish-grey; chin and throat dull white, faintly streaked blackish-brown; breast and flanks light brown and belly to undertail-coverts dull white, all except undertail-coverts finely streaked blackish-brown; iris dark brown, bill dark grey with pale brown base of lower mandible. Juvenile is largely rufous above, wing-coverts edged rufous, underparts white with broad streaking; first immature like adult female, but underparts more heavily and extensively streaked, and juvenile remiges, rectrices and wing-coverts retained; second immature male indistinguishable from adult female. Race *fretorum* is somewhat smaller than nominate, male with chestnut collar and breastband narrower, black breastband broader, female plumage as nominate; *carnarvoni* is a little larger, male similar to nominate but upperside-coverts grey, female upperparts lighter, underparts more buffy. **Voice.** Song a loud melodious whistle of 4–6 notes. Contact call a loud "wheel" or "too-wheel"; alarm "per weet".

**Habitat.** Dense mangroves, rarely into gallery monsoon forest.

**Food and Feeding.** Invertebrates, especially insects, crustaceans and small molluscs, usually 5–20 mm in size. Forages on ground, logs, mangrove roots, trunks and low branches; also in foliage. Extracts prey from cracks in trunks and branches; uses bill to crack open mollusc shells.

**Breeding.** Season late Aug to Oct; apparently single-brooded. Territorial throughout year. Nest built by both sexes, a small flattened cup made from fine twigs, bound externally with spider web, lined with grasses, including spinifex (*Triodia*), external diameter 12–15.9 cm, height 6–10 cm, internal diameter 5.5–8.3 cm, depth 2.5–4.3 cm; placed 1.5–5 m from ground in vertical fork or twigs near trunk in mangrove; linear territory 50 m to several hundred metres, depending on quality. Clutch 2 eggs, sometimes 1, light olive to dark cream, spotted with brown and light purple, with underlying spots, mostly at large end, 25.7–26.1 × 18 mm; incubation of eggs and feeding of chicks by both sexes, no information on duration of incubation and nestling periods. Maximum recorded longevity more than 15 years 8 months.

**Movements.** Sedentary. All recoveries of marked individuals less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Fairly common but local. Distribution broken by gaps in mangrove habitat.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Bruce & McAllan (1990), Campbell, A.J. (1901, 1909), Ford (1987, 1988b), Gahrn-Beckmann (1974b), Gyldenstolpe (1955a), Jackson (1909b), Johnson (1990), Johnson & Storey (2004), Mack (1933), Mathews (1920c), Mayr (1954), Schodde & Mason (1999).





*ssp. paryula*

*ssp. fortis*

*ssp. kirhocephalus*

43

42

inches

4

10

PLATE 36

44

45

*ssp. brunnea*

*ssp. harmonica*

46

47

*ssp. kirhocephalus*

*ssp. rufiventris*

*ssp. ferrugineus*

51

*ssp. leucorhynchus*

48

*ssp. meridionalis*

49

*ssp. uropygialis*

50

*ssp. jobiensis*

*ssp. merinoventris*

53

54

55

52

56

## Genus *COLLURICINCLA*

Vigors & Horsfield, 1827

### 41. Bower's Shrike-thrush

#### *Colluricincla boweri*

**French:** Pitohui de Bower **German:** Graurückenpitohui **Spanish:** Picanzo de Bower  
**Other common names:** Stripe-breasted Shrike-thrush, Stripe-breasted/Bower Thrush

**Taxonomy.** *Collyriocincla boweri* E. P. Ramsay, 1885, Cairns, Queensland, Australia.

**Monotypic.**

**Distribution.** NE Queensland (Cooktown S to Cardwell), in NE Australia.



**Descriptive notes.** 19.5–21 cm; 39–48 g. Male has crown, head side and upperparts dark brownish-grey to grey, lores pale grey; upperwing dark brownish-grey, remiges edged olive-brown on outer webs, tail grey-brown, rectrices edged brown; chin cream, throat brown with heavy grey streaks, grading to dull rufous on underparts; iris red-brown; bill black; legs bluish-grey. Female is similar to male, but has broad light rufous supercilium from forehead to behind orbit, lores cream, broken eyering rufous, heavier edging on remiges, iris dark brown, bill duller, base of lower mandible paler. Immature is like female; older male

acquires darker bill. **Voice.** Song a clear whistle, rephrased in many variations, c. 20 different song types recorded, starting quietly and fast, becoming loud and rich, "da-dee da-dee pon-pon-pon". Call "tuck"; alarm a harsh grating.

**Habitat.** Tropical rainforest and regrowth, rarely adjacent wet sclerophyll; mostly above 400 m. **Food and Feeding.** Insects; rarely, frogs. Forages at various heights, usually below canopy, rarely on ground; ground 1–2%, herb layer (below 1 m) 1–2%, understorey (1–5 m) 9–4%, subcanopy (5–10 m) 32–9%, lower canopy (10–17.5 m) 31–8%, upper canopy (17.5–25 m) 18–8%, emergents from canopy (above 25 m) 4–7%. In wet season, forages more in lower strata of forest. Obtains prey by gleaning (95–3%), occasionally sallying (4–7%). Feeds mainly among leaves (live and dead) and small twigs and branches (79–8%), remainder of time from branches, trunks, vines and epiphytes (19%), rarely on ground (1–2%).

**Breeding.** Season Sept–Dec. In possible courtship or pre-copulatory display, two birds perched close together, one with wings lowered and fluttering and with tail raised while giving "tuck" note. Nest a compact cup of rootlets, dead leaves, twigs, fronds and bark strips, lined with rootlets, bound externally with spider web and tendrils, built 2.4–5.5 m (usually c. 3–6 m) from ground in fork of tree or sapling or in vine tangle. Clutch 2 eggs, sometimes 3, pale creamy with reddish-brown or light olive-brown blotches over lavender-grey, concentrated at large end, 27.1 × 19.7 mm; incubation of eggs and brooding and feeding of chicks by both sexes, no information on duration of incubation and nesting periods; both parents also feed fledglings. Maximum recorded longevity c. 7 years.

**Movements.** Sedentary. All recoveries of marked individuals less than 10 km from site of original ringing. Some of population may undertake altitudinal shift to lower elevations in winter; present at lower elevations throughout year at some sites.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Queensland Wet Tropics EBA. Common within its small range.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901, 1920), Ford (1979c), Frith, C.B. & Frith (1990b), Frith, D.W. (1984), Galbraith (1974b), Higgins & Peter (2002), Kloot (2000), Le Souëf (1908), Mathews (1923a), Schodde & Mason (1999).

### 42. Little Shrike-thrush

#### *Colluricincla megarhyncha*

**French:** Pitohui châtain **German:** Waldpitohui **Spanish:** Picanzo Chico  
**Other common names:** Rufous-breasted/Rusty-breasted/Fawn-breasted Shrike-thrush, Little/Red/Rufous Thrush, Brown Shrike-lycatcher, Rufous Shrike-thrush (*megarhyncha*)

**Taxonomy.** *Muscicapa megarhyncha* Quoy & Gaimard, 1830, Dorey, Vogelkop, New Guinea. Formerly placed in the monotypic genus, *Myiolestes*. Pale race *parvula* has been treated as a separate species, but hybridizes with neighbouring *aelpies*. Described race *wuroi* (from S New Guinea) synonymized with *goodsoni*; *conigravi* (from Admiralty Gulf, in N Western Australia) merged with *parvula*. Twenty-eight subspecies recognized.

**Subspecies and Distribution.**

*C. m. affinis* (G. R. Gray, 1862) – N West Papuan Is (Waigoe).

*C. m. batantiae* (Meise, 1929) – Batanta I.

*C. m. misolienis* (Meise, 1929) – Misool I.

*C. m. megarhyncha* (Quoy & Gaimard, 1830) – Salawati I and W New Guinea from Vogelkop to Wandammen district, foot of Nassau Mts and Oranje Range.

*C. m. melanorhyncha* (A. B. Meyer, 1874) – Biak I, in Geelvink Bay (NW New Guinea).

*C. m. obscura* (A. B. Meyer, 1874) – Yapen I (in Geelvink Bay).

*C. m. ferruginea* (E. J. O. Hartert & Paludan, 1936) – foot of Weyland Mts at head of Geelvink Bay.

*C. m. hybridus* (Meise, 1929) – N New Guinea from R Mamberamo E to Humboldt Bay.

*C. m. idenburgi* (Rand, 1940) – slopes S of R Idenburg (WC New Guinea).

*C. m. maeandrina* (Stresemann, 1921) – EC New Guinea (upper R Sepik, Victor Emanuel Mts).

*C. m. tappenbecki* Reichenow, 1899 – NE New Guinea from lower and middle R Sepik and Central Highlands E to Astrolabe Bay.

*C. m. madaraszi* (Rothschild & E. J. O. Hartert, 1903) – Huon Peninsula (NE New Guinea).

*C. m. aruensis* (G. R. Gray, 1858) – Aru Is.

*C. m. goodsoni* (E. J. O. Hartert, 1930) – S New Guinea (Merauke District).

*C. m. palmeri* (Rand, 1938) – R Fly basin (S between R Oriomo and R Morehead), in S New Guinea.

*C. m. neos* (Mayr, 1931) – E New Guinea (Herzog Mts, upper R Watut and S coast of Huon Gulf).

*C. m. superflua* (Rothschild & E. J. O. Hartert, 1912) – N coast of SE New Guinea (R Aicora E to Collingwood Bay).

*C. m. despecta* (Rothschild & E. J. O. Hartert, 1903) – S coast of SE New Guinea (Hall Sound/R Angabunga E to Milne Bay).

*C. m. trobriandi* (E. J. O. Hartert, 1896) – Trobriand Is, off SE New Guinea.

*C. m. fortis* (Gadow, 1883) – D'Entrecasteaux Archipelago (Goodenough I, Fergusson I, Normanby I).

*C. m. discolor* De Vis, 1890 – Louisiade Archipelago (Tagula I).

*C. m. parvula* Gould, 1845 – NE Western Australia and N Northern Territory (E to E Arnhem Land and Groote Eylandt).

*C. m. aelpies* Schodde & Mason, 1976 – NE Northern Territory (around mouth of R McArthur).

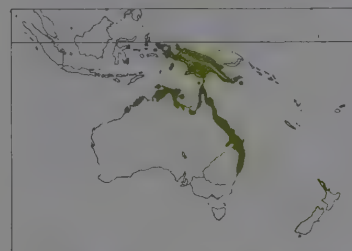
*C. m. normani* (Mathews, 1914) – N Australia on coastal Gulf of Carpentaria and N Queensland (Cape York Peninsula), and islands in Torres Strait.

*C. m. griseata* (G. R. Gray, 1858) – NE Queensland.

*C. m. synaptica* Schodde & Mason, 1999 – E Queensland coast (S Halifax Bay S to Sarina).

*C. m. gouldii* (G. R. Gray, 1858) – E Queensland coast (Broad Bay S to Harvey Bay).

*C. m. rufogaster* Gould, 1845 – SE Queensland and NE New South Wales.



**Descriptive notes.** 16.5–19 cm; 33–41 g.

Nominate race is ferruginous above, crown duller, lores and indistinct supercilium dull rufous, uppertail-coverts dull rufous-brown, lower side of face dull tawny-rufous with black shaft streaks, ear coverts dusky rufous-brown; primaries edged tawny-brown, inner secondaries entirely tawny-brown on outer webs, upperwing-coverts olive-brown, edged tawny-brown on outer webs; tail dull rufous-brown, outermost feather pair edged tawny-brown on outer web; light dull rufous below, throat and breast broadly streaked grey; iris chestnut-brown; bill dull brownish and horn; legs grey.

**Sexes alike.** Juvenile is darker rufous on upperparts and wing-coverts, underparts somewhat browner; immature similar to adult, but retains rufous-edged juvenile secondaries and wing-coverts. Races fall into several subgroups according to plumage and bill colour, with some forms intermediate between these: *aruensis* is similar to nominate, but upperparts more greyish-brown, underparts less rufous; *misolienis* similar to nominate, but ventrally much paler and more clay-coloured; *ferruginea* differs from nominate in having upperparts browner, less green, sides of head and underparts slightly redder; *batantiae* has upperparts dark olive-brown, throat buff, underparts rufous with grey suffusion, throat and breast well streaked and mottled with grey, bill sooty; *affinis* has upperparts olive-tinted greyish-brown, remiges and rectrices with some rufous edging, underparts greyish, slightly suffused buff, lightly streaked, bill pale brown and horn; *obscura* has upperparts brownish-grey, underparts grey with brownish tinge, throat streaked dark grey, breast mottled dark brown; *hybridus* is like previous, but breast and flanks slightly more ginger; *melanorhyncha* is dark olive-brown above, wings rufous, underparts paler, more olive (less rufous), streaking on underparts reduced or absent, bill dark horn; *idenburgi* has head greyish-olive, underparts pale, slightly buff, breast more evidently streaked, adult male bill; *maeandrina* has upperparts olive-brown, underparts buffier, throat and breast streaked and mottled dark grey-brown, bill blackish; *tappenbecki* has upperparts browner, duller, less olive, throat and upper breast greyer, contrasting more with ochraceous belly, bill brown; *superflua* is paler than last, duller, with underparts less ochraceous; *madaraszi* has upperparts less olive; *neos* has throat grey, bill dark grey; *palmeri* is similar to previous but throat buffier, less grey, streaks on breast more distinct, bill more straw-coloured; *goodsoni* is much paler, duller and less olive above, particularly on crown; *despecta* is paler, upperparts slightly more olive; *fortis* has crown grey, back olive-green, wing grey with green tinge, off-white or grey below, breast and flanks washed darker, throat and breast streaked, undertail-coverts pale yellow, bill black in both sexes; *discolor* is similar to previous, but crown brown, rump and uppertail-coverts yellowish-olive, underparts browner; *trobriandi* is also similar but wing and bill longer, throat and breast deeper grey, belly paler; *aelpies* is large, uniformly pale tawny, breast with little or no streaking, bill long and pinkish-brown; *normani* is small, mid-khaki in tone, breast streaking absent; *griseata* is also small, rich rufous-brown, remiges edged rufous; *synaptica* is small, deep olive-grey with brownish wash, clear breast streaks; *gouldii* is large, pale, greyer, bill shorter; *rufogaster* is larger still, deep rufous-brown, breast streaks clearer; *parvula* is distinctive, crown and upperparts dark grey-brown, tinged with olive, supercilium light grey or white, lores whitish-grey, throat white with fine streaking, breast buff-brown, central belly whitish or whitish-grey, undertail-coverts grey with fine streaks, bill black. **Voice.** In New Guinea, song 3–6 (sometimes up to 12) melodious whistled notes, with many variations, common versions are 3 notes, second notably higher and third slightly lower than first, "who-whi-oo" or "who-widoo", with additional notes often added before or after this phrase, and 5 notes, first higher, remainder down and then up scale, "fe, u-oo-u-ii"; contact call a loud "tchuck" or nasal "twik"; alarm a repeated harsh rasping. In Australia, rich, loud, melodious piping, "cup of tea, wot wot wot" in E of range, "eee, butch-butch-butcher" in NW, also other clear notes and phrases; alarm a loud "chip", harsh wheeze, also other harsh notes.

An accomplished mimic.

**Habitat.** In New Guinea, inhabits rainforest, monsoon forest, ecologically disturbed habitats, tall secondary growth and gallery forest; mainly found in lowlands, hills and lower mountains, generally up to 1850 m, but locally to 2300 m (Mt Giluwe). In Australia, found in various types of subtropical and tropical rainforest (including monsoon forest, gallery forest, littoral rainforest), less often in other dense vegetation types such as mangroves, paperbark (*Melaleuca*) swamps, riparian vegetation, regrowth forest and coastal woodland; occasionally extending into wet sclerophyll and gardens when these adjacent to rainforest; mainly lowlands, but into mountains ranges in lower numbers.

On following pages: 43. Sangihe Shrike-thrush (*Colluricincla sanghirensis*); 44. Sooty Shrike-thrush (*Colluricincla umbrina*); 45. Morningbird (*Colluricincla tenebrosa*); 46. Grey Shrike-thrush (*Colluricincla harmonica*); 47. Sandstone Shrike-thrush (*Colluricincla woodwardi*); 48. Variable Pitohui (*Pitohui kirchoccephalus*); 49. Hooded Pitohui (*Pitohui dichrous*); 50. White-bellied Pitohui (*Pitohui incertus*); 51. Rusty Pitohui (*Pitohui ferrugineus*); 52. Crested Pitohui (*Pitohui cristatus*); 53. Black Pitohui (*Pitohui nigrescens*); 54. Whitehead (*Mohoua albigilla*); 55. Yellowhead (*Mohoua ochrocephala*); 56. New Zealand Brown Creeper (*Mohoua novaeseelandiae*).



**Food and Feeding.** Invertebrates, mainly insects, but including also spiders (Araneae), snails (Gastropoda), small crabs; occasionally seeds and fruit, rarely, small birds. In New Guinea, forages mainly in understorey and middle levels (c. 3–4.5 m from ground), sometimes to lower canopy, occasionally on ground; in Australia, prefers lower strata and shrub layer of forest. In New Guinea studies: 13% of foraging on ground, 78% in understorey (0–8 m; 62% below 4 m), 6% in subcanopy (8–25 m), 3% in canopy (25–30 m). In Australia: in Northern Territory, 3–3% on ground, 0% at 0–1 m, 45–9% at 1–5 m, 32–9% at 5–10 m, 13–1% at 10–17.5 m, 4–9% at 17.5–25 m, and in another study 6% on ground, 11% at 0–2 m, 22% at 2–4 m, 33% at 4–8 m, 17% at 8–14 m, 11% above 14 m; in Queensland, ground 10%, low canopy (1 m to third of canopy height) 30%, mid-canopy (third to two-thirds canopy height) 32%, upper canopy and emergents (top third) 21%. Forages among foliage, on branches and trunks, in leaf litter and on fallen logs, in accumulated debris and vine tangles; in Australia, ground 3–3–10%, branches and trunks 11–33%, foliage 36–54%, air less than 6%, remainder included vine tangles, palm fronds, epiphytes; in New Guinea, ground 3%, branches and trunks 27%, foliage 28%, accumulations of debris 35%, remainder on vines and logs, etc. Prey captured mostly by gleaning, 70–93% (Australia) to 100% (New Guinea); also in flutter-chase (3–17%), and sally-striking in air or at vegetation (4–23%). On ground feeds among leaves by using bill, not feet. Breaks snail shells by bashing them against hard substrate.

**Breeding.** In New Guinea, nests with eggs in Mar, early and late May, Jun, mid-Sept and Oct–Dec, with eggs and young in Sept and with nestlings alone in Oct–Dec, appearing to indicate two breeding periods, main one in late dry season and early wet season, second in late wet and early dry seasons; in Australia breeds Aug–Feb; multi-brooded, up to five attempts in a season. Territorial. Nest built by both sexes, a deep, untidy cup of dead leaves, twigs, bark strips, plant fibres, rootlets and stems, loosely bound with black thread-like material and stems or (in Australia) spider web and some moss, lined with fine blackish tendrils, plant fibres, rootlets, thin stems and other fine material, external diameter 11–4–12.7 cm, height 7.6–10.3 cm, internal diameter 7–7.6 cm, depth 5.1–7 cm; usually below 2 m (occasionally as low as 0.5 m), rarely as high as 60 m, in thin upright fork among foliage, sometimes in vine tangle, among palm fronds, in fern, on top of *Pandanus* palm or on accumulation of leaf debris in shrub, usually not sheltered above. Clutch 2 eggs, occasionally 3, white, pink or yellowish-white with fine dark brown and grey (and sometimes black) or red-brown speckles or blotches over whole shell (denser on larger end), 23–28.5 × 17.4–21 mm, in Australia 2 eggs, occasionally 1, white, spotted and blotched with reddish-brown and brown with underlying grey markings, 22.9–27.9 × 17.8–20.3 mm; incubation by female, probably assisted by male, period at least 19 days at one New Guinea nest, 16–17 days in Australia; chicks fed by both parents, each making c. 2–3 feeding visits per hour, nestling period reported as 12 days in New Guinea, c. 10 days in Australia; fledglings cared for by both parents. Hatching success 60–72% in Australia. Maximum recorded longevity 16 years 8 months.

**Movements.** Sedentary in New Guinea; marked individuals repeatedly recaptured at place of banding 8 years later. In Australia, generally sedentary; present year round in some sites, local movements reported at others where birds only appear or become more abundant at certain times of year. All recoveries in Australia and New Guinea of marked birds at less than 10 km from site of original banding.

**Status and Conservation.** Not globally threatened. Common to abundant in New Guinea; in lowland rainforest near R Brown (in SE New Guinea) estimated 40 birds/10 ha; comprises c. 3–5% of avifauna in Karimui area, in Chimbu Province. In Australia, common in NE, becoming scarcer and local to S; uncommon in Top End; local declines noted in parts of Queensland.

**Bibliography.** Barrett *et al.* (2003), Bell (1977, 1982b, 1984a), Boles (1988), Brooker Braithwaite & Estbergs (1990), Campbell (1901), Coates (1990), Crome (1978), Croxall (1977), David & Gosse (2002a), Deignan (1964c), Diamond (1972), Ford (1979c, 1982), Friih & Friih (1993b), Galbraith (1974b), Gyldestolpe (1955a), Harrison & Friih (1970), Hartert (1930), Hartshorne (1953), Higgins & Peter (2002), Iredale (1956), Johnstone & Storr (2004), Le Souef (1902), Macgillivray (1918), Mackay (1981), Marshall (1935), Mathews (1923a), Mayr (1931b), Mayr & Gillard (1954), Mayr & Meyer de Schauensee (1939b), Mayr & Rand (1937), McCarthy (2006), Mees (1982), North (1902), Ogilvie-Grant (1915), Peckover & Filewood (1976), Rand (1940a, 1942a), Rothschild (1931), Rothschild & Hartert (1896, 1903a), Salvadori (1875, 1881), Schodde & Mason (1975b, 1999), Sims (1956), Tolleran (1997).

## 43. Sangihe Shrike-thrush

### *Colluricincla sanghirensis*

French: Pitohui de Sangihe German: Sangihipitohui Spanish: Picanzo de la Sangihe

**Taxonomy.** *Pinarolestes sanghirensis* Oustalet, 1881, Petta, Sangihe Island.

Was for long thought to be a race of *C. megarhyncha* owing to doubt about provenance of the few old specimens. Monotypic.

**Distribution.** Mt Sahendaruman, on Sangihe I, N of Sulawesi.



**Habitat.** Lower montane primary forest and well-established (more than 30 years old) secondary forest, at 575–1000 m.

**Food and Feeding.** Insects. Feeds in middle and upper storeys and in dense rattan undergrowth; occasionally on ground or on bark of trees.

**Breeding.** No information.

**Movements.** Sedentary.

**Status and Conservation.** CRITICALLY ENDANGERED. Was for a long time known from only two 19th-century specimens. Rediscovered in 1985 at a single site, with large roosting c. 15 km<sup>2</sup> population then estimated at c. 600 individuals (range 270–2300). More difficult to find on subsequent visit, in 1998–1999. Habitat is being extensively degraded or lost, and population assumed to be declining, earlier estimate likely too high, and possibly fewer than 100 birds remain. Some surviving remnants of disturbed forest in steep ravines on neighbouring mountains need to be checked.

**Descriptive notes.** 17–19 cm; 36 g. Plumage is olive-grey above, head slightly darker than upperparts, ear-coverts dark brown, streaked pale buff; remiges brown, inner webs darker, lesser upperwing-coverts brown, tail brown, inner webs of rectrices darker; pale grey with light buff tinge below, becoming greenish-yellow on belly, darker on flanks and undertail-coverts; iris dark grey; upper mandible dark grey-horn, lower mandible light horn; legs grey. Sexes similar. Juvenile undescribed. VOICE. Loud song of c. 10-second phrases, with much repetition. Also soft lisping “chweep, chweep”.

**Bibliography.** Anon. (2006n), Butchart & Stattersfield (2004), Collar *et al.* (2001), Ford (1979c), Meyer & Wilesworth (1898b), Riley (1997, 2002), Rozendaal & Lambert (1999), Stattersfield & Capper (2000), White & Bruce (1986).

## 44. Sooty Shrike-thrush

### *Colluricincla umbrina*

French: Pitohui ombré German: Rußpitohui Spanish: Picanzo Sombrio  
Other common names: Sooty/Obscure Whistler, Obscure Shrike-thrush

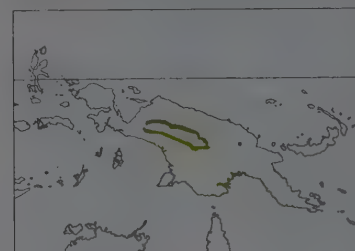
**Taxonomy.** *Melanorhectes umbrinus* Reichenow, 1915, Schraderberg, Sepik Mountains, New Guinea.

Initially considered to be a whistler and named as *Pachycephala tenebrosa*; with transfer to present genus, latter name becomes preoccupied and is therefore replaced by current one. Two subspecies recognized.

**Subspecies and Distribution.**

*C. u. atra* (Rothschild, 1931) – WC New Guinea on N slopes of Snow Mts from upper R Siriwo (Gebroeder Mts) E to R Idenburg.

*C. u. umbrina* (Reichenow, 1915) – S slopes of Snow Mts from Weyland Mts E to Mt Goliath, Hindenburg Mts and Sepik Mts; isolated record from W Schrader Mts.



**Descriptive notes.** 18–19 cm; 46 g. Nominate race has crown and head side black to blackish-brown, upperparts dark brown; upperwing and tail dark brown; dusky brown below, throat greyer, belly slightly paler and browner; iris dark brownish-red; bill black; legs grey. Sexes alike. Juvenile undescribed. Race *atra* is darker than nominate, back about same colour as crown. VOICE. Alarm call a loud metallic “huija”.

**Habitat.** Forest and forest edges; known altitudinal range 1400–2150 m.

**Food and Feeding.** Insects. Frequents sub-stage and low shrubbery; perches and watches

for prey for long periods.

**Breeding.** Pair carrying nesting material in Dec. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains EBA. Rare and little known; described as being very shy.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Finch (1985), Gregory (1995b), Hartert *et al.* (1936), Iredale (1956), Rand (1942b), Rand & Gilliard (1967), Rothschild (1931), Stein (1936), Stresemann (1923a).

## 45. Morningbird

### *Colluricincla tenebrosa*

French: Pitohui des Palau German: Singpitohui Spanish: Picanzo de Palau  
Other common names: Palau Morning Bird

**Taxonomy.** *Rectes tenebrosus* Hartlaub & Finsch, 1868, Peleliu Island, Palau.

Has previously been placed in genus *Pitohui* or in a monotypic *Malacolestes*, but appears to be an insular derivative of *C. megarhyncha* group. Monotypic.

**Distribution.** Palau Is (Babelthup, Koror, Garakayo, Peleliu, Ngabad).



**Descriptive notes.** 18–19 cm. Male variable, with contrasting blackish hood more or less pronounced; upperparts, including upperwing and tail, sooty brown; sooty brown below, lower breast to undertail-coverts lighter, side of body and flanks darker, feathers of underparts with fine darker shafts (lightly streaked appearance); iris dark; bill dark brown; legs lighter brown. Female is smaller and somewhat lighter than male. Immature resembles adult, but head and neck lighter, ear-coverts, neck side, throat and upper breast darker, lower breast and abdomen paler. VOICE. Song a jumbled warble of liquid chirps and whistles, broken

into short segments. Call harsh raspy notes.

**Habitat.** Deep primary forest.

**Food and Feeding.** Insects, also snails (Gastropoda); some berries, fruit, green plant material and seeds also taken. Frequents ground, or understorey below 1.5 m, in areas with dense ground cover. Forages mainly on ground or on trunks and branches near ground; hops through low branches and vines, peers around for potential prey.

**Breeding.** Courtship display includes exaggerated teetering by both partners. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Palau EBA. Moderately common on Peleliu; evidently more numerous on smaller islands.

**Bibliography.** Baker (1951), Ford (1979c), Marshall (1949), Mayr (1933, 1944a), Pratt, Bruner & Berrett (1987), Pratt, Engbring *et al.* (1980).

## 46. Grey Shrike-thrush

### *Colluricincla harmonica*

French: Pitohui gris German: Graubruspitohui Spanish: Picanzo Gris  
Other common names: Whistling/Pale-headed Shrike-thrush; New Guinea Shrike-thrush (*superciliosa*); Brown/Northern Shrike-thrush (*brunnea*); Western/Buff-bellied/South-western Shrike-thrush (*rufiventris*); Harmonious Shrike-thrush/Thrush (*harmonica*)

**Taxonomy.** *Turdus harmonicus* Latham, 1801, Sydney, New South Wales, Australia.

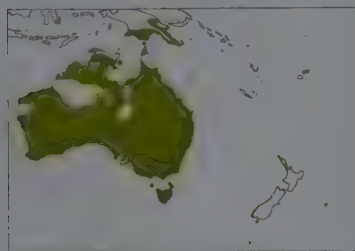
Races have sometimes been divided into three species: one in New Guinea and N Australia (*superciliosa* and *brunnea*), one in W, C & SC Australia (*rufiventris*), and a third in E Australia and



Tasmania (nominate and *strigata*). Considerable geographical variation, and up to 13 local forms sometimes distinguished, but races intergrade widely. New Guinea population often separated as *tachycrypta*; differs somewhat from birds in NE Australia (Cape York, in N Queensland), but not sufficiently to warrant subspecific recognition. Other named races, all in Australia, are *paryti* (Kimberly District of Western Australia), *roebucki* (Roebuck Bay, in Western Australia) and *julietae* (interior NW Australia), all merged with *brunnea*; *pallidus* (E Queensland), and *anda* (NE South Australia) and *halmaturina* (SE South Australia and adjacent New South Wales and Victoria), all merged with nominate; *whitei* (interior South Australia), synonymized with *rufiventris*; and *kingi* (King I., in Bass Strait), merged with *strigata*. Five subspecies recognized.

#### Subspecies and Distribution.

*C. h. brunnea* Gould, 1841 – N Western Australia, Northern Territory and NW Queensland.  
*C. h. rufiventris* Gould, 1841 – S half of Western Australia and Northern Territory and W two-thirds of South Australia.  
*C. h. superciliosa* Masters, 1876 – S & E New Guinea E from Sepik Basin and Wewak in N and, in S, from Kurik (inland to Sogeri Plateau, Bulolo valley, N & S Eastern Highlands Province and Mount Hagen town), Torres Strait islands and extreme NE Australia (N Cape York Peninsula).  
*C. h. harmonica* (Latham, 1801) – S half of Queensland and S to NE & SE South Australia, New South Wales and Victoria.  
*C. h. strigata* Swainson, 1838 – islands in Bass Strait and Tasmania.



**Descriptive notes.** 22–5–25 cm; 58–74 g. Male nominate race has top of head and hindneck rich dark grey, lores white, side of face and neck paler grey than head top, malar area pale grey; mantle, back and scapulars olive-brown, rump and uppertail-coverts dark grey; upperwing grey with light brownish wash, remiges and greater coverts dusky grey with light grey edging, tail dark grey; chin and upper throat pale grey to off-white, grading to light grey on lower throat (throat occasionally indistinctly streaked), darker grey on breast, light grey on flanks and belly to white or whitish on crissum and undertail-coverts; iris dark reddish-brown; bill black; legs dark grey to black. Female is similar to male, but lores light grey, narrow eyering pale grey, malar area and chin to upper breast streaked dark grey, bill grey, sometimes paler base of lower mandible. Juvenile has broad rufous supercilium, lores brownish-grey, upperparts brown, rump and uppertail-coverts brownish-grey, remiges and wing-coverts broadly edged rufous, underparts heavily streaked, crissum and undertail-coverts white, iris dark brown; first immature male like adult female, but with light rufous-brown supercilium, eyering light rufous-buff, retained juvenile wing feathers, chin and throat with extensive fine streaking, iris dark brown, bill black or dark grey with paler base of lower mandible, first immature female similar but bill grey, base of lower mandible paler; second immature like adult of respective sex (or with malar area, chin and throat more heavily streaked). Races differ in size and in plumage tones; *strigata* is larger than nominate, with very long bill, plumage darker above, slightly greyer, much paler throat, male lores greyer, female slightly buffier on flanks and belly, more rufous on crissum; *rufiventris* is smaller than nominate, plainer grey above, throat white to grey, lower underparts buff to pale rufous; *brunnea* is rather large, with very long tail, much paler and browner than nominate, both sexes with throat and upper breast streaked, female with thin pinkish-buff supercilium, often slight buff tinge below; *superciliosa* is similar to previous but slightly greyer, with diffuse white supercilium extending behind eye, often faint dark streaks on chin and throat, sexes very similar. Voice. Song, throughout year (mainly during breeding season), by both sexes, a rich, melodious series of discrete flute-like notes, varying in duration, volume and pitch (often at least one note noticeably louder than rest), finishing with drawn-out note or high clear whistle, much geographical and individual variation, males have c. 16 song phrases, females c. 11, uttered in differing combinations; many transliterations, in Australia e.g. “purr-purr-purr-queé-yulé”, “wok-che-whitee”, “pip-pip-pip-ho-ee”, “too-ton-too-weet”, “purr-purr-purr-wok-wok-wok-ho-wheé”, “yo-ho-ee”, “ee-al-ee-al-perkwee”, in New Guinea e.g. “wiioh-witu, whoo-whee”, “whu-whitu”, “wutchóo-wutchóo-watchóo”, “whi-whi-whi-whi-whi-whi-tsu”, “whitééé”. Also has quiet subsong. Calls include whistling “whit-whit-whit”, “yorick”, “chong”; harsh distress and alarm notes. An accomplished mimic.

**Habitat.** Wide variety of wooded habitats, mainly dominated by eucalypt (*Eucalyptus*) or acacia (*Acacia*), particularly inland; also in *Banksia* woodland, coastal heath, agricultural areas, gardens, homesteads, exotic pines (*Pinus*) and rainforest; in drier country frequents riparian areas. In New Guinea inhabits savanna woodland, mangroves, coastal scrub, secondary growth, town gardens, coconut plantations and rubber plantations. Sea-level into mountains; to 1700 m in New Guinea.

**Food and Feeding.** Invertebrates, mainly insects, also spiders (Araneae) and millipedes (Diplopoda); also vertebrates, including frogs, lizards, small birds and small mammals; also fruits, seeds. Arboreal and terrestrial, feeding at all levels, in habitats with lower canopy or more open understorey spends greater amount of time on ground. In more mesic habitat with high canopies: at New England Tableland (New South Wales), 22–3% of foraging on ground, 7–3% at 1–2 m, 6–7% at 3–5 m, 24–9% at 6–9 m, 35–2% at 10–14 m, 3–6% above 15 m; at Bombala (New South Wales), 38% a 0–0.2 m, 23% in shrub (0.2–4 m), 28% in subcanopy (4.1–10 m), 11% in canopy (above 10 m); in Kakadu National Park (Northern Territory), 36% on ground, 14% at 0–2 m, 5% at 2–4 m, 27% at 4–8 m, 18% at 8–14 m. In more open habitats with low canopies: at Big Desert (Victoria), 56% on ground, 5% at 0.5–1 m, 21% at 1–1.5 m, 15% at 1.5–2 m, 3% at 2–3 m. In Dryandra State Forest (Western Australia), 63% on ground, 5% at 0.2–1 m, 14% at 1–1.5 m, 18% above 5 m. Across range, forages on variety of substrates: ground (20–57%), foliage (4–50%), branches (5–55%), trunks (3–21%), low shrubs (6–14%). In Tasmania, may spend less time on twigs and branches and more on trunks of trees. Main capture methods are gleaning, probing and sally-striking on foliage; proportions differ between mainland Australia (glean 61–82%, probe 4–18%, sally-strike 6–20%) and Tasmania (glean 38%, probe 58%, sally-strike 2–5%). Larger prey bashed or wedged into clefts to allow processing; snails dropped on to hard surfaces, and small vertebrates sometimes attacked by two birds in co-operation. Seen to use small sticks to probe in crevices (to flush insects). Readily learns to approach humans for handouts. Joins mixed-species foraging flocks.

**Breeding.** Eggs in Jul–Feb in Australia (in N & W starts earlier and more likely to breed also at other times, depending on conditions); in New Guinea nests in Feb–May and Aug–Nov (mainly Oct), nest with eggs in late Sept and late Oct and fledglings in late Oct, implying main breeding activity during second half of dry season and another during middle to late wet season; 1–3 broods per season, up to four attempts if clutches lost (at one New Guinea nest, two broods reared in late dry season and third in late wet season, after a break of 6 months). Territorial throughout year. Nest built by both sexes, a sturdy open cup of bark strips, rootlets, twigs and leaves, lined with grass and finer bark, twigs and rootlets, external diameter 8.3–22.9 cm, height 6.2–12.7 cm, internal diam-

eter 7.9–12 cm, depth 5.5–6.5 cm (size dependent on site, in cavity often small with thin walls, in fork larger with thicker walls), placed in fork or tangle of vegetation, in crevice, on stump, ledge or ground, in man-made object or habitation, at up to 20 m above ground but usually below 3–5 m, occasionally at ground level (recorded in mine shaft); often reuses nest of another species, either relining it or building a nest within it; will reuse site in same season and for several consecutive seasons. Clutch 1–4 eggs, usually 3, white or creamy white, blotched and spotted with grey and olive-brown, nominate race 25.9–33.3 × 21.3–22.9 mm (N races on average somewhat smaller, Tasmanian race somewhat larger); sexes contribute about equally to incubation and brooding during day, only female incubates and broods at night, both parents feed young; incubation period 15–19 days, nestling period 17–18 days; may reneat c. 16 days after previous brood fledged. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Hatching and fledging success quite variable. 32–91–5% and 20–90% of eggs, respectively; nest predators include Laughing Kookaburra (*Dacelo novaeguineae*), Noisy Friarbird (*Philemon corniculatus*) and Australian Raven (*Corvus coronoides*). Maximum recorded longevity 12 years 6 months.

**Movements.** Present all year in some localities; appearance at other sites seasonal, may involve dispersal of young. No evidence of large-scale movements, although part of population undertakes altitudinal shifts in winter; some evidence of local movements, although nature and extent not understood. Longest movement of marked individual 22.5 km; 99–5% of ringed birds recovered less than 10 km from site where originally captured.

**Status and Conservation.** Not globally threatened. Widespread in Australia; fairly common to scarce in New Guinea. In Australia, those in E more tolerant of urbanization than those in W, although former show some declines owing to habitat loss and degradation; more common in unlogged areas than in logged ones, and more numerous in larger tracts of habitat than in smaller ones. In New Guinea, appears to be colonizing new areas on N coast and in highlands.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Brooker, Braithwaite & Estberg (1990), Cale (1994), Campbell (1901), Carter (1924a), Coates (1990), Condon (1951), Courtney & Marchant (1971), Deignan (1964e), Disney (1971), Fletcher (1915b), Ford, H.A. *et al.* (1986), Ford, J.R. (1987b), Ford, J.R. & Parker (1974), Galbraith (1974b), Gannon (1945), Hanks (1933), Harshorne (1953), Higgins & Peter (2002), Hill (1911), Hindwood & Salmon (1955), Hobbs (1960), Holmes & Recher (1986), Iredale (1956), Johnstone & Storr (2004), Keast (1985, 1994a, 1994b), Le Souëf (1902, 1904, 1908), Legge (1908), Littler (1910), Macdonald (1968a), Major *et al.* (1999b), Mathews (1923a), McCarthy (2006), Mees (1964, 1982), North (1902), Parker (1970a), Peckover & Filewood (1976), Rand (1942a), Recher & Davis (1997, 1998), Recher *et al.* (1985), Reilly (1966a, 1966b), Salmon (1961), Salvadori (1881), Sedgwick (1949), Serventy & Whittell (1976), Schodde & Mason (1999), Smith (1985), Stevens & Watson (2005, 2006), Sutton (1924), Thompson (1923), Whitlock (1922), Woinarski (1987), Wolstenholme (1929).

## 47. Sandstone Shrike-thrush

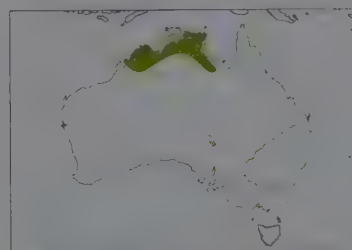
### *Colluricincla woodwardi*

**French:** Pitohui des rochers **German:** Braunbrustpitohui **Spanish:** Picanzo Roquero  
**Other common names:** Brown-breasted/Red-bellied/Woodward's Shrike-thrush, Sandstone/C'cliff Brown-breasted Thrush

**Taxonomy.** *Colluricincla woodwardi* E. J. O. Hartert, 1905, South Alligator River, Northern Territory, Australia.

Somewhat paler and greyer birds in W of range sometimes separated as a geographical race, *assimilis*, but differences from E birds slight and variation apparently clinal. Monotypic.

**Distribution.** N Western Australia (E from Kimberley), N Northern Territory and extreme NW Queensland.



**Descriptive notes.** 25–26–5 cm; 50–60 g. Male has head and neck dark grey, shading to olive-tinted brownish-grey on upperparts; side of face whitish-buff, lores paler; upperwing dark greyish-brown, tail dark brown; chin pale grey, throat whitish-grey with fine grey streaks, underparts pale brown, breast washed grey, thighs greyer; iris brown; bill black; legs dark brown. Female has paler bill than male. Juvenile is paler, secondaries and wing-coverts edged rufous, throat paler than breast, underparts lightly mottled; immature like adult, but with rufous wings edgings (soon lost). Voice. Rich, clear, varied song includes 2 repeated whistles. Call

a metallic “pink”; contact call a strident “peter”.

**Habitat.** Sandstone escarpments, gorges and hills, extending locally into limestone, granite and quartzite outcrops, rarely into monsoon escarpment forest; frequents areas with cliffs and boulders, usually with ground cover of low shrubs, scattered trees and spinifex (*Triodia*).

**Food and Feeding.** Insects and spiders (Araneae), occasionally small vertebrates. Forages on ground, in spinifex clumps and cracks in rocky substrate, under boulders and ledges.

**Breeding.** Eggs in late Oct and early Nov in Western Australia and late Aug to late Jan in Northern Territory. Nest a cup of spinifex, twigs and rootlets, lined with rootlets, external diameter 16–18 cm, height 6 cm, internal diameter 7.5–10 cm, depth 3.5–5 cm, placed on or under rock ledge or in cavity c. 2–11 m from base of cliff. Eggs 2–3, white, with brown and dark grey markings chiefly at larger end. 16.7–29.7 × 19.1–20.8 mm. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Locally common.

**Bibliography.** Barnard (1914), Barrett *et al.* (2003), Boeckel (1980), Boles (1988), Campbell (1901), Galbraith (1974b), Higgins & Peter (2002), Hill (1911), Johnstone & Storr (2004), Mathews (1923a), May (1970), Schodde & Mason (1999), White (1914).

## Genus PITOHUI Lesson, 1831

## 48. Variable Pitohui

### *Pitohui kirchocephalus*

**French:** Pitohui variable **German:** Ockerpitohui **Spanish:** Pitohui Variable  
**Other common names:** Greater Wood-shrike/Pitohui

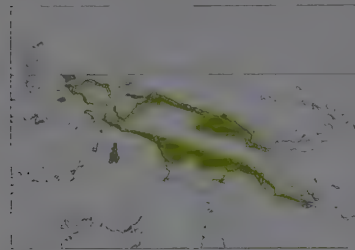


**Taxonomy.** *Lantus Lachryphalus* Lesson and Garnot, 1827, Doré, Vogelkop, New Guinea. Considerable geographical variation, with many named races and areas of intergradation between edg. em. forms. Races fall into several groups based mainly on colour of head, throat and breast, but complicated by sexual dimorphism in some populations and much individual variation. Proposed race *salvadorii* (from W coast of Geelvink Bay) represents an intergrade population. Twenty subspecies recognized.

**Subspecies and Distribution.**

- P. k. cerviniventris* (G. R. Gray, 1862) – N West Papuan Is (Waigeo, Gemien).  
*P. k. pallidus* van Oort, 1907 – Batanta I and Sagewin I.  
*P. k. uropygialis* (G. R. Gray, 1862) – S West Papuan Is (Salawati, Misool).  
*P. k. tibialis* (Sharpe, 1877) – NW New Guinea (W half of Vogelkop).  
*P. k. kirhocephalus* (Lesson & Garnot, 1827) – NE coast of Vogelkop (S to Momi).  
*P. k. dohertyi* Rothschild & E. J. O. Hartert, 1903 – NW New Guinea (Wandammen District and adjacent islands).  
*P. k. rubiensis* (A. B. Meyer, 1884) – NW New Guinea (head of Geelvink Bay).  
*P. k. brunneivertex* Rothschild, 1931 – SE coast of Geelvink Bay.  
*P. k. jobiensis* (A. B. Meyer, 1874) – islands in NE Geelvink Bay (Yapen I, Kurudu I).  
*P. k. meyeri* Rothschild & E. J. O. Hartert, 1903 – N coast of New Guinea from R Mamberano E to R Tami.  
*P. k. senex* Stresemann, 1922 – upper Sepik Valley (N New Guinea).  
*P. k. brunneicaudus* (A. B. Meyer, 1891) – NE New Guinea from lower R Sepik E to upper R Ramu.  
*P. k. decipiens* (Salvadori, 1878) – Onin Peninsula, in SW New Guinea.  
*P. k. adiensis* Mees, 1964 – Adi I (off S coast of Bomberai Peninsula).  
*P. k. stramineipictus* van Oort, 1907 – Triton Bay district of SW New Guinea.  
*P. k. caroliniae* Junge, 1952 – Etna Bay.  
*P. k. ariensis* (Sharpe, 1877) – Aru Is.  
*P. k. nigripictus* van Oort, 1909 – S New Guinea from R Mimika E to upper R Eilanden.  
*P. k. brunneiceps* (D'Alberty & Salvadori, 1879) – S New Guinea from R Fly E to Gulf of Papua.  
*P. k. meridionalis* (Sharpe, 1888) – SE New Guinea E from Chads Bay and Yule I district.

**Descriptive notes.** 23–25.5 cm; 75–83 g. Nominative race has head grey, upperparts dark reddish-brown; upperwing and tail fuscous; throat grey, underparts ferruginous; iris reddish-brown; bill black; legs grey. Sexes alike. Immature is similar to adult. Races differ mainly in plumage colour and pattern, in following list head and throat grey (as nominate) in first ten races, black in next five, and brown in final four: *brunneicaudus* has upperparts and underparts not so richly coloured as nominate; *senex* is similar but underparts slightly paler; *caroliniae* is very like nominate, but head darker grey, upperparts dark brown, rump and



tail darker, underparts paler; *decipiens* has wings and tail blacker, head much darker in male, only slightly so in female; *dohertyi* is similar to previous, but wings and tail black, body darker and richer, male head black, female blackish; *adiensis* is also similar, but head and breast darker, lower breast and below slightly lighter orange-brown; *rubensis* is again similar, but male head and tail somewhat paler, female slightly paler than male; *stramineipictus* similar to previous but head ashy, underparts yellowish-white; *cerviniventris* has crown and side of head paler and greyer than back, upperparts greyish-brown, wings and tail darker, more brownish, throat greyish-brown, underparts ferruginous, *pallidus* is like previous but paler, particularly on underparts; *uropygialis* upper back, lower breast and belly rich red-brown, remainder of plumage black; *tibialis* is similar to last, but deeper red-brown above and below; *nigripictus* male has back chestnut, belly ferruginous, remainder of plumage black, female similar but breast also ferruginous; *ariensis* is similar to previous, but belly deeper-coloured, more chestnut, breast chestnut mixed with black, female head and throat dusky (not black); *meridionalis* has upperparts rusty chestnut, belly and undertail-coverts rufous-buff, female head and throat grey-brown to dark brown, wings and tail brown; *brunneiceps* has head and throat brown, otherwise like previous, bill black; *brunneivertex* has head and throat brown, but underparts bright ferruginous and side and top of head same or slightly paler, remainder of upperparts, tail and outer edges of remiges light rufous-brown, bill horn-coloured; *jobiensis* is similar to last, but much deeper and richer cinnamon-rufous; *meyer* is also similar but underparts paler, more ferruginous brown, head slightly paler, throat darker and more grey-brown, underparts paler. **Voice.** Song loud, musical whistles mixed with scratchy notes in jumbled series, starting with shorter notes, then becoming louder and longer upslurs, commonly includes upslurred whistles, 2 notes with second somewhat higher than first, staccato whistles and rising series of rattled notes, e.g. "tow-hu, tow-hu-u-u-u-u, tow-whi-éw, tow-hu-éw, tow-wé-éé, tu-wu"; often given by two birds, one member of pair starting and this quickly joined by other, also by neighbouring males when abundant. Also a loud, harsh syllable with slight pause after first note, "éék, ukikikéw". In duet at dawn, first bird gives whistled upslur, second answers with staccato "tup".

**Tail and upslurred note**

**Habitat.** Forest edges, tall secondary growth, disturbed forest, primary rainforest, swamp-forest, gardens; lowlands to 1100 m, locally to 1500 m.

**Food and Feeding.** Insects and fruit. Ranges from understorey to canopy; often hides in dense vegetation. Joins mixed-species foraging flocks.

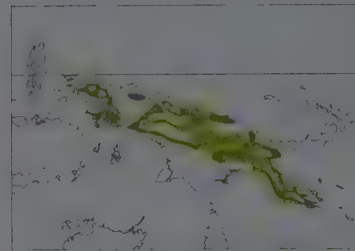
**Breeding.** Nestling in late Jun or early Jul. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Common to very common in some areas; rare or absent in others. In places where very common, can constitute up to c. 2% of total local avifauna. **Bibliography.** Beehler *et al.* (1986), Bell (1970b), Coates (1990), Diamond (1972, 1987), Diamond & Terborgh (1968), Dumbacher (1994, 1997), Dumbacher *et al.* (1992), Gilliard & LeCroy (1966), Hartert (1930), Hartert *et al.* (1936), Hoogmoed (1971), Iredale (1956), Junge (1953), Mayr & Meyer de Schauensee (1939b), Mees (1965), Ogilvie-Grant (1915), Rand (1942b), Rand & Gilliard (1967), Ripley (1964a), Rothschild (1931), Rothschild & Hartert (1903a), Salvadori (1875, 1881), Schmid (1993).

Monotypic.

**Distribution.** New Guinea, including Yapen I.



woiy"; two downslurred whistles, "tiuw tow"; three rising whistles increasing in volume, "hui-whui-whoee"; and six rapid, identical upslurs.

**Habitat.** Forest, forest edges and secondary growth, occasionally mangroves and low beach trees. Occurs in hills and lower to middle mountains at 350–1700 m, occasionally to 2000 m; locally down to sea-level (e.g. Jayapura, Madang, Huon Peninsula, Lae, middle R Fly, Hall Sound, Hisiu). At elevations between those occupied by *P. kirhocephalus* and *P. nigrescens*, with some overlap.

**Food and Feeding.** Mainly fruit, including small figs (*Ficus*); some insects and grass seeds. Nestlings fed with berries and invertebrates. Found at most levels, from undergrowth to canopy.

**Breeding.** Laying female in mid-Oct, nests with eggs in mid-Nov and mid-Feb, with chicks late Oct, mid-Dec and mid-Feb, also fledglings late Oct and early Nov, indicative of breeding in late dry season to middle wet season, at least. Possibly co-operative breeder; at least three adults seen to feed chicks at one nest, and four or five defending nest. Nest a cup of curly vine tendrils, lined with fine tendrils, suspended from slender branches c. 2 m above ground. Clutch 1–2 eggs, creamy or light pinkish-stone, spotted and blotched light and dark brown to black, with underlying light grey patches all over or mainly at larger end, 27–32.8 × 20.5–22.2 mm.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common. Less numerous in places when sympatric with *P. kirhocephalus*: on Mt Karimui comprised 0.7% of local avifauna at 1100 m (where co-occurs) and 2–5.6% at 1220–1570 m (where no overlap).

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Diamond (1972), Dumbacher (1992, 1997), Dumbacher *et al.* (1992), Gilliard & LeCroy (1961a), Gyldestolpe (1955a), Halliwell (1992), Iredale (1956), Lamothe (1979), Legge & Heinsohn (1996), Mayr & Rand (1937), Mourison & Madsen (1994), Ogilvie-Grant (1915), Parker (1962), Rand (1942b), Rand & Gilliard (1967), Salvadori (1881).

## 50. White-bellied Pitohui

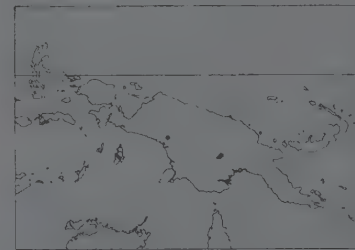
### *Pitohui incertus*

**French:** Pitohui à ventre clair **German:** Fleckenbrustpitohui **Spanish:** Pitohui Ventri blanco  
**Other common names:** Brown/Mottled/Mottle-breasted Pitohui, Brown Wood-shrike

**Taxonomy.** *Pitohui incertus* van Oort, 1909, Noord River, west-central New Guinea.

Monotypic.

**Distribution.** WC & EC New Guinea: R Noord (Bivak I), and upper R Fly (Kiunga E to Palmer Junction).



may sing alone, second one evidently never so. Call 5 or more downslurred notes on constant or rising pitch.

**Habitat.** Lowland forest, usually with broken canopy and open middle storey, on flat subcoastal plain, in areas of high annual rainfall (more than 3750 mm), where forest seasonally inundated.

**Food and Feeding.** Insects and fruit. Frequents dense vegetation and vine tangles in lower canopy of forest, at 5–18 m. Joins mixed-species foraging flocks.

**Breeding.** Male with enlarged testes in mid-Aug. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in South Papuan Lowlands EBA. Known from just two tiny areas in New Guinea, one c. 90 km up R Noord and the other 320 km E from there, between Kiunga and Palmer Junction, on R Fly. Locally fairly common to common within this exceedingly small range; parties observed c. 1 km apart. Seasonally flooded lowland forest in high-rainfall areas very poorly known ornithologically; further fieldwork may reveal that this species is more widely distributed in this habitat across N Trans-Fly region.

**Bibliography.** Anon (2000), Beehler *et al.* (1986), Burchard & Sainsford (2004), Coates (1990), Diamond & Raga (1978), Dumbacher *et al.* (1992), Gregory (1997), Iredale (1956), Junge (1939), van Oort (1909a), Rand (1938, 1942b), Rand & Gilliard (1967), Salvadori (1881), Stattersfield & Capper (2000).

## 51. Rusty Pitohui

### *Pitohui ferrugineus*

**French:** Pitohui rouilleux **German:** Einfarbepitohui **Spanish:** Pitohui Herrumbroso  
**Other common names:** Ferruginous Wood-shrike Pitohui

**Taxonomy.** *Rectes ferrugineus* Bonaparte, 1850, Lobo, Triton Bay, west New Guinea. Six subspecies recognized.

## 49. Hooded Pitohui

### *Pitohui dichrous*

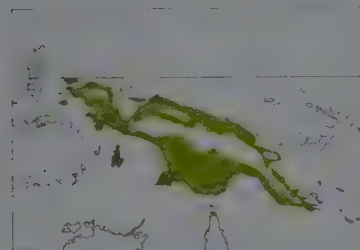
**French:** Pitohui bicolor **German:** Zweifarbenpitohui **Spanish:** Pitohui Bicolor  
**Other common names:** Bicoloured Lesser Pitohui, Lesser Wood-shrike

**Taxonomy.** *Rectes dichrous* Bonaparte, 1850, Lobo, Triton Bay, west New Guinea.



# Subspecies and Distribution.

*P. f. leucorhynchus* (G. R. Gray, 1862) – N West Papuan Is (Waigeo I).  
*P. f. fuscus* Greenway, 1966 – Batanta, S of Waigeo.  
*P. f. ferrugineus* (Bonaparte, 1850) – islands of Salawati and Misool, and NW mainland New Guinea from Vogelkop I. to Wandammen and Ima Bay, and S slopes of Nassau Mts and Oranje Mts.  
*P. f. holerythrus* (Salvadori, 1878) – Yapen I (in Geelvink Bay) and N New Guinea E at least Humboldt Bay area (and presumably Vanimo).  
*P. f. brevipennis* (E. J. O. Hartert, 1896) – Aru Is.  
*P. f. clarus* (A. B. Meyer, 1894) – S & E New Guinea.



**Descriptive notes.** 25.5–28.5 cm; 77–110 g. Nominate race has crown and side of head (to below orbit) and upperparts brown, tinged rufous, uppertail-coverts rufous; remiges dusky brown, edged light brown, upperswing-coverts brown, tinged rufous; tail rufous; light rusty buff below, throat paler; iris white, whitish-buff or straw-coloured; bill black; legs grey. Sexes alike. Immature is similar to adult, but iris dark. Race *leucorhynchus* is much darker than nominate, with bill greyish-white; *fuscus* is similar but darker, particularly on upperparts; *brevipennis* is also darker than nominate, but paler than previous two, with bill black;

*holerythrus* is darker than nominate but paler than last; *clarus* is paler than nominate. **Voice.** Song a loud “wvit-oo”, repeated several times with increasing loudness, and many varied phrases, often repeated, sometimes increasing in volume, e.g. “whūti-whūti-whūti”, “whūti-whūti-téōw” and “whūti-whūti-how-how-how”; also a bubbling “whi-hou-hou”. Contact call a low whistled “phew or teuw”, repeated several times; scold a harsh rasping note.

**Habitat.** Rainforest, monsoon forest, gallery forest, tall secondary growth, sometimes extending into disturbed areas and teak (*Tectona*) plantations adjacent to forest edge. Lowlands and hills to 800 m, locally to 1100 m.

**Food and Feeding.** Insects (including larvae) and fruit. Frequents understorey to lower canopy. Feeds in flocks, with or without other species. Foraging heights when feeding alone differ from those when with mixed-species flock, latter also different when New Guinea Babbler (*Pomatostomus isidorei*) present: individually, 58% of foraging in main canopy, 21% in subcanopy and 21% in understorey; in mixed flocks with babblers, 48% in canopy, 30% in subcanopy and 22% in understorey, but without babblers respective figures are 78%, 11% and 11%. Captures prey by gleaning and snatching from surface of leaves, bark, vine and accumulated debris in trees; rarely feeds on ground.

**Breeding.** Nest-building during wet season, copulation in early Feb, eggs in Jul, mid-Oct and mid-Nov, adults in breeding condition in late Aug, courtship feeding seen in early Oct and early Nov, and occupied nest in Jan, indicative of breeding from late dry season to middle of wet season, at least. Possibly co-operative breeder, reports of fledgling being fed by more than two individuals. Courtship feeding with either partner offering food item; the one receiving it may adopt begging posture, with wings and tail lowered and quivering. Nest a bulky, deep cup of thin sticks, woody vines, rootlets, dead leaves and other vegetation, lined with fine woody stems and tendrils, external diameter c. 12–13 cm, internal diameter c. 8 cm, built 1.5–3.5 m (usually c. 2 m) from ground in vertical fork of sapling. Clutch 1 egg, pale blue to pinkish-purple, or reddish-grey to rose-brown, with dark purplish-brown, greyish and red spots mainly around larger end, 32.5–37 × 21.5–24.3 mm. No information on incubation and nestling periods.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Fairly common to common. In SE New Guinea, estimated density near R Brown 15 birds/10 ha.

**Bibliography.** Beehler *et al.* (1986), Bell (1982b, 1983), Coates (1977, 1990), Diamond (1987), Dumbacher (1994, 1997), Gilliard & LeCroy (1961a, 1966), Greenway (1935), Hoogerwerf (1971), Iredale (1956), Mees (1982), Rand (1942a, 1942b), Rand & Gilliard (1967), Rothschild (1931), Safford & Atwood (1996), Salvadori (1881).

## 52. Crested Pitohui

### *Pitohui cristatus*

**French:** Pitohui huppé **German:** Schopfpitohui **Spanish:** Pitohuí Crestado  
**Other common names:** Crested Wood-shrike

**Taxonomy.** *Rectes cristata* Salvadori, 1876, Mount Morait, north Vogelkop, New Guinea.

Three subspecies recognized.

# Subspecies and Distribution.

*P. c. cristatus* (Salvadori, 1876) – NW & W New Guinea: mountains of Vogelkop and Onin Peninsula, Weyland Mts and Nassau Mts.  
*P. c. arthuri* E. J. O. Hartert, 1930 – N & C New Guinea E to Sepik Mts in N and Karimui area of Chimbu Province in S; Cyclops Mts; R Oriomo area, S Trans-Fly region.  
*P. c. kodonophonus* Mayr, 1931 – SE New Guinea E from L Kutubu.



**Descriptive notes.** 25–26 cm; 78–111 g. Nominate race has crown, hindneck and upper part of face dark olive-rufous, long crest of same colour reaching to nape when lying flat, lower part of face and side of neck medium rufous; upperparts, including upperswing, dark olive-brown with rufous tinge, especially on uppertail-coverts, remiges narrowly edged paler on outer webs; tail dull rufous-brown; light rufous below, breast washed darker rufous, flanks less so; iris brown to dark brown; bill black; legs pinkish-grey. Sexes alike. Immature is similar to adult but duller, dusker, upperswing-coverts edged rufous, bill paler.

Face *arthuri* has upperparts more olive, less rufous, than nominate, *kodonophonus* is paler below. **Voice.** Song a long series of bell-like notes, beginning slowly, increasing in speed while slowly dropping in pitch; sometimes each note preceded by a short soft “ist”, may be given continuously for 2–3 minutes, or occasionally up to 15 minutes, creating a probing, monotonous sound. Also series of rising and falling notes, “tick-annuh” and “whoo-ty”. Alarm call harsh rasping notes.

**Habitat.** Primary rainforest, mainly in foothills, adjacent lowlands and hills to 1300 m, locally to lowlands proper.

**Food and Feeding.** Insects. Forages mainly on ground, sometimes in trees, particularly in middle levels. Joins mixed-species foraging flocks.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Widely distributed and locally fairly common; elsewhere scarce. Markedly shy, with consequent lack of observations; true level of abundance probably underestimated. Present in Varirata National Park.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Diamond (1972, 1987), Hartert (1930), Iredale (1956), Mayr (1931b), Rand & Gilliard (1967), Salvadori (1876a, 1881).

## 53. Black Pitohui

### *Pitohui nigrescens*

**French:** Pitohui noir **German:** Mohrenpitohui **Spanish:** Pitohuí Negro  
**Other common names:** Dusky Pitohui/Wood-shrike

**Taxonomy.** *Rectes nigrescens* Schlegel, 1871, Arfak Mountains, Vogelkop, New Guinea.

Six subspecies recognized.

# Subspecies and Distribution.

*P. n. nigrescens* (Schlegel, 1871) – Vogelkop (Tamarau Mts, Arfak Mts), in NW New Guinea.  
*P. n. wandamensis* E. J. O. Hartert, 1930 – Wandammen Peninsula, in W New Guinea.  
*P. n. meeki* Rothschild & E. J. O. Hartert, 1913 – mountains in W New Guinea (Weyland, Nassau and Oranje Ranges).  
*P. n. buergeri* Stresemann, 1922 – EC New Guinea (Sepik Mts and Hindenburg Mts F to Mt Hagen).  
*P. n. harterti* (Reichenow, 1911) – Huon Peninsula (Sarawaged Mts), in NE New Guinea.  
*P. n. schistaceus* (Reichenow, 1900) – SE New Guinea E from Herzog Mts.



**Descriptive notes.** 23 cm; 73–86 g. Male nominate race has body entirely slaty black, crown and side of head slightly darker, flanks slightly more slaty, remiges and rectrices blackish-brown; iris dark brown or grey-brown; bill and legs black. Female has crown ashy brown, forehead and lores slightly greyer, sides of face and neck tawny-brown, upperparts olive-brown, rump and uppertail-coverts slightly more reddish, remiges brown, edged chestnut on outer webs, wing-coverts washed reddish-brown, greater coverts with olive tinge, tail chestnut; throat ashy brown, underparts tawny-brown; iris umbre, bill blackish-brown, lower mandible

sometimes paler, legs dark grey. Juvenile male is generally sooty greyish-brown to blackish with chestnut edges of feathers, including wing-coverts; immature male like adult but lighter, retains some juvenile wing-coverts, bill pale; immature female like adult, but retains some juvenile wing-coverts. Race *wandamensis* is similar to nominate, but male belly black, female crown more rufous-brown. Like back; *meeki* male is deeper black, female with less grey tinge; *buergeri* like previous, but female bright reddish-brown, especially on underparts; *schistaceus* male is more slaty black, female more grey-tinged below; *harterti* is like last, but female browner, less grey-tinged below. **Voice.** Many vocalizations, varying geographically and individually. Include series of rising downslurred notes like burps, increasing in speed; buzzy, upward-inflected “wheel” or “whurr”; up to 9 rising and falling whistled notes, “wheu-wheu-wheu...”; whistled descending “hooo”; rising disyllabic note repeated 2–3 times; descending and then rising “houie”; rising series of 10 staccato “kwik” notes.

**Habitat.** Inhabits lower montane forest, mainly at 1600–2000 m, locally down to 1000 m and up to 2600 m.

**Food and Feeding.** Insects and fruit, occasionally seeds. Forages from ground to lower canopy, mainly in substage and middle stage. Gleans prey from foliage and ground.

**Breeding.** Adult feeding young in mid-Sept, female with egg in oviduct in late Nov, and egg in late Dec. Nest a cup of fern fronds and fine rootlets, built high in tree. Clutch 1–2 eggs, maroon-brown or deep pink (slightly buffish-tinged), spotted and blotched with light and dark brown and grey, or dark reddish-brown and purple, 32–33.2 × 22.6–23.7 mm. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Uncommon.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961a, 1970), Greenway (1935), Harrison (1971), Hartert (1930), Hartert *et al.* (1936), Iredale (1956), Mayr & Gilliard (1954), Ogilvie-Grant (1915), Parker (1962), Rand & Gilliard (1967), Rothschild (1931), Rothschild & Hartert (1903a, 1913), Salvadori (1881).

## Genus MOHOUA Lesson, 1835

### 54. Whitehead

#### *Mohoua albicilla*

**French:** Mohoua à tête blanche **German:** Weißköpfchen **Spanish:** Mohoua Cabeciblanco  
**Other common names:** Popokatea

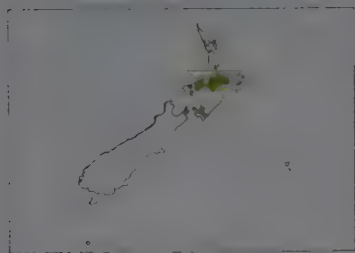
**Taxonomy.** *Fringilla albicilla* Lesson, 1830, Bay of Islands, North Island, New Zealand.

Sometimes treated as conspecific with *M. ochrocephala*. Monotypic.

**Distribution.** New Zealand: North I (S of Mt Pirongia and Te Aroha, including Mt Egmont and axial mountain system from East Cape S to Cook Strait), Little Barrier I, Arid I and Kapiti I.

**Descriptive notes.** 15 cm; male 18 g, female 15 g. Male has head and neck off-white, hindneck occasionally with faint grey-brown wash, upperparts cold brown, uppertail-coverts somewhat darker, upperswing and tail brown, outer primaries edged pale grey-brown; off-white below, flanks washed light grey-brown; iris dark brown, bill and legs black. Female is similar to male, but crown to hindneck tinged brown. Juvenile is like female, but side of head and neck, flanks and underparts washed brown; immature as adult female. **Voice.** Song a descending bell-like trill with 3 “nu” notes, and then 3–4 or more “ni” or other notes. Chant often in group, sometimes “che-che-che” and “swerte” when excited, “chirrt” in agitation.





**Habitat.** Native forest and dense scrub, usually large tracts, occasionally small isolated patches, also exotic conifer plantations, more rarely gardens, farms and orchards, breeds mainly in southern beech (*Nothofagus*) forest and manuka (*Leptospermum*) scrub. From coast to 1300 m.

**Food and Feeding.** Invertebrates, mainly insects, some spiders (Araneae); also seeds and fruit. Forages at all vegetation levels. In native vegetation (Little Barrier I), 3.4% of foraging on ground, 8.1% below 1.5 m, 16.4% at 1.6–3 m, 17.7% at 3.1–4.5 m, 16.8% at 4.6–6 m, 14% at 6.1–7.5 m, 13.4% at 7.6–9 m, 6.3%

at 9.1–11.5 m, and 4.2% above 11.5 m; in exotic pine (*Pinus*) plantation (Kaingaroa Forest), 0% on ground, c. 20% at 1.1–5 m, c. 34% at 5.1–10 m, c. 27% at 10.1–15 m, c. 14% at 15.1–20 m, c. 5% at 20.1–25 m. Foraging substrates foliage (c. 40% native; 72% pine, both live and dead needles), twigs and branches (c. 47% native; 22% pine, including cones), and trunks (13% native; 4% pine). Most food obtained by gleaning, occasionally by sally-striking in air or sally-hovering. Removes flakes of bark with bill; hangs upside-down to feed. Holds food item under foot to secure it while dismembering it. Forms flocks of 8–10 individuals, sometimes up to 40, rarely to 70; also joins mixed-species foraging flocks.

**Breeding.** Eggs usually in Oct–Dec; sometimes two broods. Monogamous, breeds as pair, often with up to six helpers. Territorial when breeding. In courtship display, two males approach female, one on each side, with wing lowered and quivering and tail fanned; males bow and raise tail and twist and turn body, one interposes himself between female and other male, latter then shifts to other side of female; display restarts, and continues until one male selected by female. Nest built by female, work taking 4–7 days to up to 2 weeks, a deep cup of grass, twigs, leaves, twigs, rootlets, bark strips and moss, bound externally with spider web, lined with feathers, wool, moss, bark and other vegetation, external diameter 10–12.7 cm, height 7.6–9 cm, internal diameter 5–6.4 cm, depth 2.9–4.5 cm; placed 1.2–5.5 m (usually c. 2.5 m) from ground, rarely to 30 m (Little Barrier I), in fork or intermeshed twigs in dense foliage of shrub or canopy of tree. Clutch 2–4 eggs, white (occasionally deep pink), minutely speckled or marbled with yellowish to reddish-brown, markings denser towards larger end; incubation by female, period 17–19 days; chicks fed by both parents and by any helpers present, nestling period 16–19 days; all also feed fledglings, which dependent for 4–6 weeks post-hatching, and may be fed for up to 8–9 months; some juveniles remain as helpers for up to 31 months. Female may start new nest for second brood while male and any auxiliaries continue to feed first brood. Nests parasitized by Long-tailed Koel (*Eudynamis taitensis*). Capable of breeding in first year, but in more densely populated areas may not have opportunity until 2–3 years old. Maximum recorded longevity 8 years.

**Movements.** Largely sedentary; some local movements possible, but apparent absence may reflect seasonal changes in conspicuity. Some juveniles disperse, others remain in natal area; ringed juveniles move less than 350 m in first year, up to 650 m in years 2–3.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in North Island of New Zealand EBA. On North I, now in moderate numbers only in forested areas S of Mt Pirongia and Te Aroha; has increased in some localities. Formerly widespread and abundant throughout vegetated areas of the island; decline in N noted in 1870s, subsequently extirpated. Formerly common on Great Barrier I, now extinct. Common on Kapiti I and Little Barrier I: 50–60 birds/ha on latter. Successfully introduced on Tiritiri Matangi I. Decline a result of clearing of native forests, but species has adapted to exotic conifer plantations, where 0.15–3.1 birds/ha. Nests and eggs lost to rats (*Rattus*).

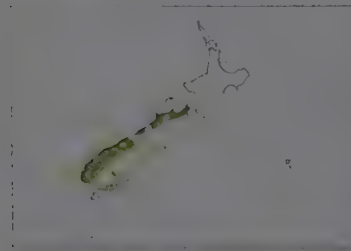
**Bibliography.** Armstrong *et al.* (1995), Buller (1873, 1882), Gibb (1961), Gill (1990b, 1993), Gill & McLean (1986, 1992), Gill & Veitch (1990), Gravatt (1971), Hamel & McLean (1989), Heather & Robertson (1997), McLean (1982, 1986, 1987a, 1987b, 1988), McLean & Gill (1989), McLean & Waas (1987), McLean, Wells *et al.* (1987), Miskelly *et al.* (2005), Moored & Fitzgerald (1982), Moncreiff (1929), Oliver (1955), Reischek (1887b), Robertson *et al.* (1983), Southey & Gill (2003), St Paul & McKenzie (1976).

## 55. Yellowhead

### *Mohoua ochrocephala*

French: Mohoua à tête jaune German: Gelbköpfchen Spanish: Mohoua Cabecigualda  
Other common names: Mohoua (Houa), Bush Canary

**Taxonomy.** *Muscicapa ochrocephala* J. F. Gmelin, 1789, Queen Charlotte Sound, New Zealand. Sometimes treated as conspecific with *M. albicilla*. Monotypic.  
**Distribution.** New Zealand: South I.



**Descriptive notes.** 14–15 cm; 28–32 g. Has head and neck bright yellow, crown and hindneck with varying amounts of olive mottling; upperparts olive-brown, grading to olive on uppertail-coverts; remiges dark brown, edged olive on outer webs, wing-coverts yellowish-brown; tail dark yellow-olive; chin, throat and breast bright yellow, lower belly pale greyish-white, breast side, flanks and thighs often washed pale brown, undertail-coverts off-white, tinged yellow; iris very dark brown; bill and legs black. Some females have greater amount of mottling on head, but sex of many individuals indeterminate. Juvenile

has upperparts more olive than adult's, underparts paler. Voice. Song 6–8 musical, rapidly repeated, frequently varied, trilled notes; rattle of rapid staccato notes often added to end of song. Alarm a harsh scolding note; also "lukaart, lukaart" call by female a few days before and after egg-laying.

**Habitat.** Native southern beech (*Nothofagus*) forest, preferably large tracts with open understorey in mountain valleys up slopes, to c. 900 m. Historically occupied podocarp-hardwood forest, but gone from most by 1900s.

**Food and Feeding.** Invertebrates, mainly insects; also small fruits and nectar. Feeds mainly in middle to upper layers of subcanopy and canopy, less than 4% of foraging on ground, 10–14% in lower understorey, c. 20% in upper understorey, 34–41% within canopy, 14–30% in top of canopy. Most foraging takes place in foliage (c. 46%), less on trunks (c. 17%), dead wood (c. 14%) and

branches (c. 21%). About a quarter of foraging time used in scanning for prey. Gleaning comprises c. 90% of foraging attacks. Food items held in foot and raised to bill or repositioned in bill. Forms foraging flocks of 3–40 individuals; also frequently joins mixed-species flocks.

**Breeding.** Season Oct–Feb, most eggs Nov–Dec; double-brooded. Breeds as monogamous pair, usually with one helper. Territorial while breeding. Nest built by female, a cup-shaped structure of rootlets, twigs, grass and other plant material, lined with finer vegetation and feathers, placed 1.7–3.1 m (usually c. 1.4–1.5 m) from ground in cavity in dead or live tree trunk or stump, usually with top rim more or less level with bottom edge of entrance; mean diameter of entrance hole 7.7 cm, opening 0–3.1 cm (mean 1.3 cm) from bottom of hollow. Clutch 2–4 eggs, pinkish-white to reddish-cream, spotted and blotched pale and dark reddish-brown, occasionally grey with pale brown markings, 23–24 × 17.5–19 mm; incubation by female (in some instances two females share role), fed by male, period c. 21 days; chicks fed by both parents and any helper present, nestling period c. 22 days; all also feed fledglings, which dependent for several days and stay in small family group for some time; female sometimes builds new nest and lays eggs before first brood has fledged. Nests parasitized by Long-tailed Koel (*Eudynamis taitensis*). Hatching success 28.6–69.2%, 38.1–80% of nestlings fledge; extensive predation on nests, chicks and sitting females by introduced stoats (*Mustela erminea*) and black rats (*Rattus rattus*). Maximum recorded longevity at least 16 years.

**Movements.** Local seasonal movements, usually in winter flocks; moves along same elevation, also descends from montane valleys.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in South Island of New Zealand EBA. Uncommon and very patchily distributed; restricted to large tracts of native forest, mainly in Fiordland and Arthur's Pass. Current population fewer than 3000 individuals. Formerly abundant, but suffered dramatic decline from 1880s and during 20th century, much of this since 1960s; now absent from c. 75% of former range. Major threats are clearing and modification of habitat, resulting in loss of suitable nesting and feeding trees. In addition, predation by stoats and black rats a significant threat, periodic population explosions of these mammals causing marked periodic local losses of birds; population levels of present species found to rise in places where stoat-control programmes undertaken.

**Bibliography.** Anon. (2006b), Buller (1873, 1882), Butchart & Stattersfield (2004), Child (1978), Choquenot (2006), Cunningham & Holdaway (1986), Davidson (1992), Dilks (1999), Dilks *et al.* (2003), Elliott (1986, 1992, 1996a, 1996b), Elliott & Rasch (1995), Elliott *et al.* (1996), Gaze (1985), Heather & Robertson (1997), Lawrence (2002), Lawrence & Palmer (2000), McLean & Waas (1987), Moncreiff (1929), O'Donnell (1996), O'Donnell & Dilks (1989, 1994), O'Donnell & Phillipson (1996), O'Donnell *et al.* (1996), Oliver (1955), Oppel & Beaven (2004b, 2004c), Read (1987, 1988, 1989), Read & O'Donnell (1987), Soper (1960), Stattersfield & Capper (2000), Stiller (2001).

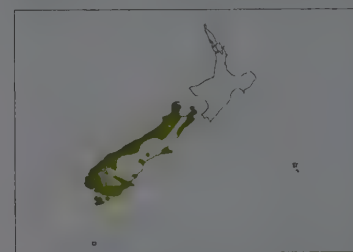
## 56. New Zealand Brown Creeper

### *Mohoua novaeseelandiae*

French: Mohoua pipipi German: Graubraunköpfchen Spanish: Mohoua Pipipi  
Other common names: Brown Creeper, Pipipi

**Taxonomy.** *Parus novaeseelandiae* J. F. Gmelin, 1789, Dusky Sound, South Island, New Zealand. Previously placed in a monotypic genus, *Finschia*. Monotypic.

**Distribution.** New Zealand: South I, Stewart I and their nearer outlying islands.



**Descriptive notes.** 12.5–13.5 cm; male 12–14 g, female 10–12 g. Has forehead and broad centre of crown dark reddish-brown, grading into grey-brown on nape, hindneck and back, remainder of upperparts dark reddish-brown, rump somewhat brighter; face, side of neck and ear-coverts grey, pale buff stripe behind eye; upperwing dark brown, outer primaries with slight pale edging on outer webs; tail reddish-brown, all rectrices except central pair with dark brown spot a third of the way in from tip; throat and underparts light greyish-brown, sides and flanks with pinkish wash; iris hazel-brown; bill pale pinkish-grey, culmen grey; legs light brown to pinkish-grey. Sexes similar. Juvenile is like adult, but head duller, yellow gape prominent. Voice. Song of male 5–14 loud whistles, slurs and harsh notes, that of female 4–9 rapid, brief notes of which last or near-last one long and high-pitched; sexes duet with respective songs, also utter "chee-up" during unison singing. Two (occasionally three) rival males engage in interactive singing, one changing to pattern of other. Also 4–6 descending trilled notes by male. Contact call a brief "zick"; pre-copulatory chatter by both sexes during chases; various other short phrases.

**Habitat.** Native forest of southern beech (*Nothofagus*) and *Leptospermum*, exotic pine (*Pinus*) forest, forest regrowth; prefers forests with simple structure. Sea-level to alpine scrub.

**Food and Feeding.** Insects, also small fruits. Fruits eaten mainly during autumn. Forages at all levels in forest, more towards upper levels; in various studies, less than 1% to 4% on ground, 4–14% in lower understorey, 18–82% in upper understorey, 4–64% in canopy. Forages in foliage (26–60%), on twigs (18–30%), and on branches and trunks (10–54%). Captures prey by gleaning (c. 75%) and hanging (c. 25%); probes into cracks in bark, hangs upside-down and climbs along underside of branch. Forages in pairs when breeding, often in flocks of 3–12 (rarely up to 50) individuals in non-breeding season. Often joins mixed-species flocks.

**Breeding.** Season Sept–Feb, with several peaks of laying related to first and subsequent clutches; up to four breeding attempts in a season. Monogamous, breeds as pair, few records of extra-pair feeding in unusual circumstances. Territorial, neighbours perform unison singing, approaching and retreating as part of display, if fighting occurs, male only with male, female only with female, rivals may hold each other with feet and peck, sometimes falling to ground and continuing there. Male courtship-feeds female, chases for 2–5 minutes, male hops through vegetation in pursuit while quivering wings, both adults sing before egg-laying, only male thereafter. Nest built by female, a deep cup of bark strips, moss, dead leaves and lichens, bound externally with spider web, lined with grass, wool and feathers, elliptical, with base wider than top, external diameter 9–10 × 8–9 cm, height 6–7 cm, internal diameter 4 × 5 cm, depth 4 cm, placed 1.6–9.4 m (mean 4.7 m) from ground in upright fork, occasionally vine tangle, in dense foliage or concealed by overhanging vegetation, average size of territory 0.97 ha. Clutch 2–3 eggs, white or light pink (occasionally dark pink or light brown), variably covered with spots, blotches and streaks in shades of brown or purple, often concentrated at larger end; incubation by female, period c. 19 days; chicks brooded by female, fed by both sexes, nestling period 20 days; young huddle together for first few days

after leaving nest, then follow adults, capable of feeding themselves at 18–20 days after fledging, become independent at 35–65 days. Nests parasitized by Long-tailed Koel (*Eudynamys taitensis*). Hatching success 63–70%, fledging success 36–50%; eggs and chicks preyed on by introduced stoats (*Mustela erminea*) and black rats (*Rattus rattus*).  
**Movements.** Mainly sedentary. Possibly some local or altitudinal movement by adults; juveniles form small roving flocks in non-breeding season.

**Status and Conservation.** Not globally threatened. Locally common. Widespread, but range has contracted after clearance of forest and introduction of exotic predators, particularly stoat and black rat. Has adapted to exotic pine forests.  
**Bibliography.** Buller (1873, 1882), Clout & Gaze (1984), Cunningham (1983, 1984, 1985), Gill (1980), Gill *et al* (1980), Guthrie-Smith (1925), Heather & Robertson (1997), Henderson (1977), McLean, Dean & Hamel (1987), O'Donnell & Dilks (1989), O'Donnell & Dilks (1994), Oliver (1955), Sherley & Cunningham (1985)



## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family PETROICIDAE (AUSTRALASIAN ROBINS)



- Small, rather stocky passerines with large rounded head and rather big eyes, short to moderately long, straight, thin bill with upper mandible hooked to varying degree, some with broader, flatter bill, most species with moderately long and slender legs, rounded to slightly pointed wings, short to moderately long tail, a few with very short or very long tail; plumage generally olive, grey, brown or black above, often with pale wingbar, and frequently more colourful below, some species black, grey and white, a few taxa all black.
- 10–22 cm.



- New Guinea, Australia and New Zealand, marginally to west-central Pacific.
- Most wooded areas, ranging from arid zones to rainforest.
- 14 genera, 46 species, 135 taxa.
- 1 species threatened; none extinct since 1600.

## Systematics

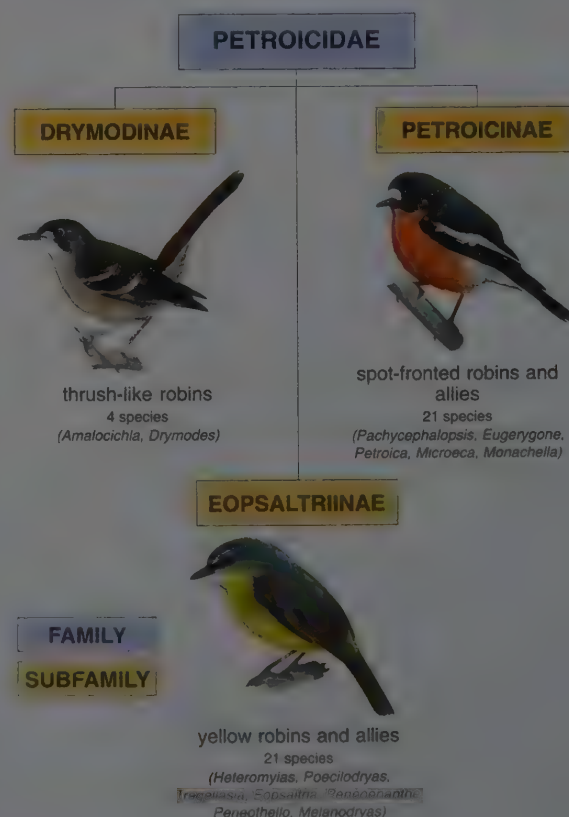
In its present worldwide usage, the word “robin” is, in effect, an ecological term denoting rather plump, upright birds that forage by pouncing on terrestrial insects from an elevated perch. They often have a brightly coloured breast. The name, which originates from that of the small chat-like European Robin (*Erithacus rubecula*), was transferred to superficially similar-looking species by British colonists in their new homes in various parts of the world. There are many bird species of this general form in Australia, and, although other names have at times been given to some, the group required some inclusive name and the term “robin” prevailed.

Some of the earlier systematists placed the larger, more heavy-billed petroicids with the whistlers (*Pachycephalidae*) or the shrikes (*Laniidae*), but eventually taxonomists aligned these species more closely with other members of the Australasian robins. In traditional arrangements, this group was placed together with the Old World flycatchers in the family *Muscicapidae*. DNA–DNA hybridization studies, however, concluded that the robins were not closely related to the muscicapid flycatchers and were, instead, part of a larger, near-endemic Australasian passerine radiation. These were subsequently separated at family level. It is worth noting that, although the name *Eopsaltriidae* was used extensively at first for the current family, it was replaced by the name *Petroicidae*, which has priority. The DNA–DNA hybridization results included the robins with the Australasian-centred crow-like relatives in the “parvorder Corvida”, but outside the core assemblage. Later studies, using DNA-sequencing, indicated that the *Petroicidae* in fact occupied a basal position within the other oscine parvorder, the *Passerida*.

The centre of robin evolution is to be found Australia, which houses 15 endemic species, and New Guinea, which harbours 19 such species. A further six are shared between the two countries. One New Guinea species occurs also in New Britain. Three species are found in New Zealand, and one each in New Caledonia and Tanimbar, while one petroicid has a range extending from the Solomon Islands, Vanuatu and Norfolk Island eastwards through Fiji to Samoa.

There have been partial revisions of the family, concentrating on Australian, New Zealand or New Guinean taxa, but a new

treatment of the entire *Petroicidae* has not yet been published. Several linear sequences have appeared in recent years. Perhaps the most important is J. L. Peters’s *Check-list of Birds of the World*, the relevant volume of which, published in 1986, included 39 species in 11 genera. In the present treatment, these are expanded to 42 species, allocated to 12 genera, to which are added four



Subdivision of the  
*Petroicidae*

[Figure: John Cox]

species in two genera, *Amalocichla* and *Drymodes*, that Peters's list had included with the thrushes (Turdidae). These changes follow more recent practice among taxonomists. There are several additional modifications that could be considered. Suggested changes in generic compositions and sequence are explained below, but their incorporation in the classification awaits a better forum. A molecular-genetic approach to the systematics of the Petroicidae would be welcome. Traditionally, adult plumage has been the predominant character on which classifications have been based, with lesser roles being accorded to bill size and shape and to development of the legs; the configuration of the vomer was introduced as a character for the Australian taxa. In the present work, juvenile plumage, egg coloration and nest construction are added to these as further taxonomic criteria.

Peters's *Check-list* did not incorporate any subdivisions of the family, but R. Schodde and I. J. Mason, in their 1999 review of the Australian taxa, introduced three subfamilies. It is now apparent that a fourth subdivision is required, and non-Australian robins can, with one exception, be easily allocated to one or other of these four.

The subfamily Drymodinae comprises the two thrush-like genera *Amalocichla*, which contains the ground-robins, and *Drymodes*, which consists of the two scrub-robins. These were conventionally placed in the Turdidae because of their largely terrestrial lifestyle, upright posture and associated morphology, such as long legs. *Drymodes* was subsequently shown to lack the thrushes' characteristic structure of the syrinx, the "turdine thumb", and DNA-DNA hybridization studies identified this genus as part of the Australasian robin assemblage. One species, the Northern Scrub-robin (*Drymodes superciliosus*) is found in both New Guinea and Australia, where it is an inhabitant of rainforest. Its congener, the Southern Scrub-robin (*Drymodes brunneopygia*), lives in the semi-arid regions of Australia. Both species are typically thrush-like in their appearance and behaviour, and differences between them in adult and juvenile plumages are probably related to the markedly different habitats that they occupy.

While the current familial placement of *Drymodes* has been widely accepted, there remains uncertainty with regard to *Amalocichla*, which may be incorrectly associated with the family Petroicidae. Earlier taxonomists placed the two ground-robins in

various genera either in the babbler family (Timaliidae) or with the jewel-babblers and allies (Eupetidae). In the early 1940s, the ground-robins were transferred to Turdidae, but were usually regarded as separate from the "true" thrushes. A relationship with the *Drymodes* scrub-robins was considered the most likely. Although data on syringeal characters and DNA-DNA hybridization were lacking for *Amalocichla*, this genus was shifted to Petroicidae in concert with *Drymodes*. Molecular information on *Amalocichla* has not yet been published, but this genus, too, has since been found not to have the turdine thumb. The tricipital fossa of the humerus of *Amalocichla* was shown to differ from that of *Drymodes*. The state of this character was considered more closely to resemble that of the thornbills (Acanthizidae), further support for such a relationship coming from similarities in adult plumage to some members of the latter family, particularly the mouse-warblers (*Crateroscelis*). Major differences from acanthizids include the cup-shaped, rather than domed, nest and the possession of mottled juvenile plumage. The relationships of *Amalocichla* remain unresolved. For the moment, the genus is retained in Petroicidae as a matter of convenience, and is arbitrarily placed next to *Drymodes* in sequence because of the thrush-like morphology of the two genera. The appearance and behaviour of the two *Amalocichla* species, both restricted to New Guinea, are reflected in some of their previous group names, which include "ground-thrushes", "New Guinea thrushes" and "velvet-thrushes". The Lesser Ground-robin (*Amalocichla incerta*) occurs at middle elevations throughout the mountain ranges, whereas the larger Greater Ground-robin (*Amalocichla sclateriana*) has a much more restricted distribution, within which it is rare or, at least, quite secretive.

Schodde and Mason's subfamily Eopsaltriinae currently contains 21 species in seven genera. These share a forward-pointing vomer and other skull characters, and exhibit general similarities in their nests and eggs. There are two types of juvenile plumage, which are strongly, but not completely, correlated with the distribution of other characters. Three genera have more or less unstreaked nestlings, but the nestlings of the others are characterized by the possession of paler shafts on the body and covert feathers, producing a streaked appearance.

Juveniles of *Heteromyias*, *Poecilodryas* and *Tregellasia* species all have rufous or brick-red plumage. The first two genera

The Petroicidae are generally small, stocky passerines with large rounded heads and big eyes. Traditionally, the family was subsumed into the Old World flycatchers (Muscicapidae) but genetic work has concluded that petroicids merit their own family as part of a near-endemic Australasian passerine radiation. The two thrush-like species in *Amalocichla*, including the Lesser Ground-robin, have been attached to the petroicids, although their true taxonomic affinities remain far from clear. *Amalocichla* are stocky, stout-legged birds that run like plovers (Charadriidae) along the floor of montane rainforests in New Guinea.

[*Amalocichla incerta brevicauda*, Huon Peninsula, NE New Guinea.

Photo: William. S Peckover]







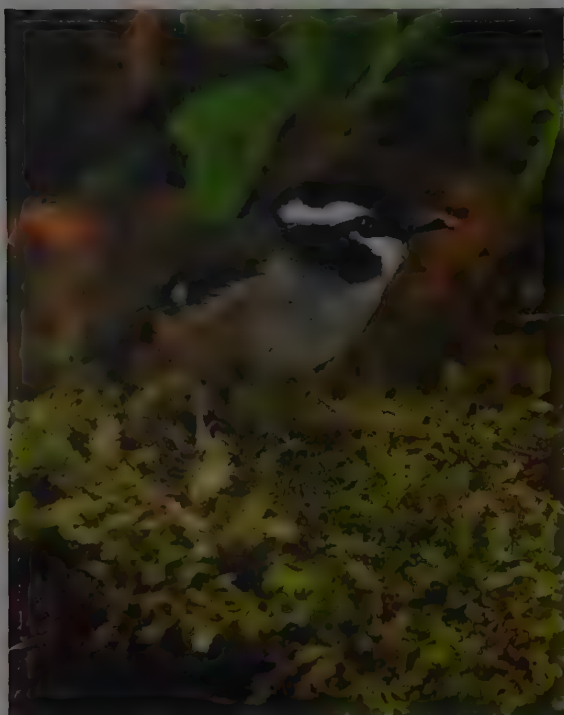
The genus *Drymodes* comprises two scrub-robins conventionally placed with thrushes (*Turdidae*) due to their largely terrestrial lifestyle, upright posture and associated morphological characteristics such as long legs and tail. DNA studies, however, indicated their true affinities to belong with the Australasian robins. The **Southern Scrub-robin** lives in semi-arid scrub, whereas the **Northern Scrub-robin** (*D. supercilialis*) inhabits rainforest. This split in habitat preferences is thought to result in notable differences between the scrub-robins in adult and juvenile plumages.

[*Drymodes brunneopygia*, Gluepot, South Australia, Australia.  
Photo: Peter Fuller]

are particularly close to each other. *Poecilodryas*, however, is badly in need of reassessment. The six species listed in Peters's *Check-list* exhibit some markedly disparate plumages. Four of the six, the White-browed (*Poecilodryas superciliosa*), Buff-sided (*Poecilodryas cerviniventris*), Black-sided (*Poecilodryas hypoleuca*) and Black-chinned Robins (*Poecilodryas brachyura*), have prominent white eyebrows and wingbars on the dorsal surface. The Olive-yellow Robin (*Poecilodryas placens*) and the Black-throated Robin (*Poecilodryas albonotata*), on the other hand, lack these patterns and have strikingly different plumage colours. The present composition of *Poecilodryas*, which at times

has also included the Mangrove Robin (*Peneoenanthe pulverulenta*), was originally drawn up by E. Mayr in 1941, in a somewhat brief discussion of New Guinea taxa. His basis for this grouping was the shared juvenile colour and rather robust bill and feet. The four species displaying a patterned face and wingbars form a natural group, to which the name *Poecilodryas* should probably be restricted. The Olive-yellow Robin has been segregated by some taxonomists in the monotypic *Genneadryas*; with its strongly yellow plumage, it may be better placed near, or even with, the yellow robins of the genus *Eopsaltria*. There seem to be no obvious close relatives of the Black-throated Robin. In addition to its plumage differences, this species forages in a manner quite different from that of the other members of *Poecilodryas* and it has a comparatively massive bill. If it merits separation in a monotypic genus, the name *Plesiodyras* is available. The Australian representatives of *Poecilodryas* occur in two disjunct populations, the eastern White-browed Robin and the western Buff-sided Robin. These have conventionally been treated as races within a single species. Recently, however, it has been generally accepted that differences between them in size and plumage warrant the treatment of each as a full species.

The genus *Heteromyias* has frequently been merged with *Poecilodryas*, and with some justification. Several populations of the Ashy Robin (*Heteromyias albispecularis*) are very reminiscent of the Black-sided Robin and its closely allied relatives. If *Poecilodryas* is maintained with its current composition, as outlined above, it is difficult to argue against the inclusion within it of the *Heteromyias* species. Were *Poecilodryas* more strictly circumscribed, however, the retention of *Heteromyias* would seem more justified. The two species in the latter genus, the Ashy Robin of New Guinea and the Grey-headed Robin (*Heteromyias cinereifrons*) of Australia, have been regarded as conspecific by some recent authors. Certainly, the Grey-headed Robin and the nominate race of the Ashy Robin are similar to each other in overall plumage. Nevertheless, recent findings with regard to the Australian and New Guinean logrunners (*Orthonyx*) show that outward appearance may be misleading as a guide to species-level relationships: similarity in plumages may be associated with marked genetic differences (see page 338). A cautious approach, therefore, is to retain two species in the genus *Heteromyias* until appropriate studies are conducted.



The two species in the genus *Heteromyias* are rather chunky rainforest dwellers. They are often considered conspecific due to similarities in plumage and other morphological features. To add to the taxonomic uncertainty, *Heteromyias* is frequently subsumed into *Poecilodryas*, a somewhat heterogeneous assemblage of robins as presently constituted. There is considerable justification for this practice: several populations of the **Ashy Robin** are reminiscent of the Black-sided Robin (*P. hypoleuca*), sharing, for example, a white supercilium and wingbar.

[*Heteromyias albispecularis centralis*, Crater Mountain, EC New Guinea.  
Photo: William S. Peckover]



The genus *Poecilodryas* houses a varied gathering of six neat forest robins that are in need of taxonomic reassessment. They are grouped together on the basis of shared juvenile colour and a rather robust bill and legs. However, whilst four species are linked by their prominent white supercilium and wingbars, two taxa have strikingly different plumage and may even belong in two separate genera. Amongst the core quartet of white-browed species, the **Buff-sided Robin** of western Australia has only recently been recognized as a distinct species from White-browed Robin (*P. superciliosa*) of further east.

[*Poecilodryas cerviniventris*, West Baines River, Northern Territory, Australia.  
Photo: Graeme Chapman]

The two species of *Tregellasia* serve as morphological bridges between the two aforementioned genera and the yellow robins in *Eopsaltria*, although this may not be indicative of the relationships among them. As with *Poecilodryas*, the juveniles are uniformly rufous, except that a number of individuals have scattered streaks, particularly on the crown. The adult plumage is much closer to that of *Eopsaltria* species, with similar colour patterns and a lack of wingbars and facial stripes. Because of the wide distribution of this plumage among petroicid species, it may be the primitive state within the family, and thus not informative with regard to taxonomic relationships. Some earlier authors subsumed *Tregellasia* in *Eopsaltria*, although recent practice has maintained these as two separate genera. The Pale-yellow Robin (*Tregellasia capito*) co-occurs with the Eastern Yellow Robin (*Eopsaltria australis*) across its range, the two often exploiting the same habitat. Its congener, the White-faced Robin (*Tregellasia leucops*), reaches the far north of Cape York Peninsula, in north-east Australia, but it is widely distributed through New Guinea, where it has differentiated extensively.

*Eopsaltria* comprises the yellow robins, although some species lacking yellow in the plumage are included in it. The Eastern Yellow Robin and its geographical counterpart, the Western Yellow Robin (*Eopsaltria griseogularis*), are obviously closely related, differing mainly in the extent of grey on the breast, and some authors have treated them as conspecific. Western individuals react to taped calls of the Eastern Yellow Robin, but the reciprocal test has not been carried out. The majority of recent treatments maintain the two as distinct species. An early colonization of south-western Australia is considered to have given rise to the White-breasted Robin (*Eopsaltria georgiana*) before a second event isolated what would become the Western Yellow Robin. These two species are separated largely by habitat. The Yellow-bellied Robin (*Eopsaltria flaviventris*), confined to New Caledonia, is one of the few members of the family that occur on small islands outside the Australia–New Guinea–New Zealand block. It resembles the Western Yellow Robin in general plumage coloration and is similar to it in behaviour. Whether these are superficial likenesses concealing the New Caledonian bird's real relationships is a question posed by the character of the eggs and juveniles, both of which are somewhat more suggestive of species of *Microeca*, rather than of *Eopsaltria*.

The Mangrove Robin has had a more varied taxonomic history than that of most members of the family. At times it was allied with the whistlers or the shrikes, before finally being placed



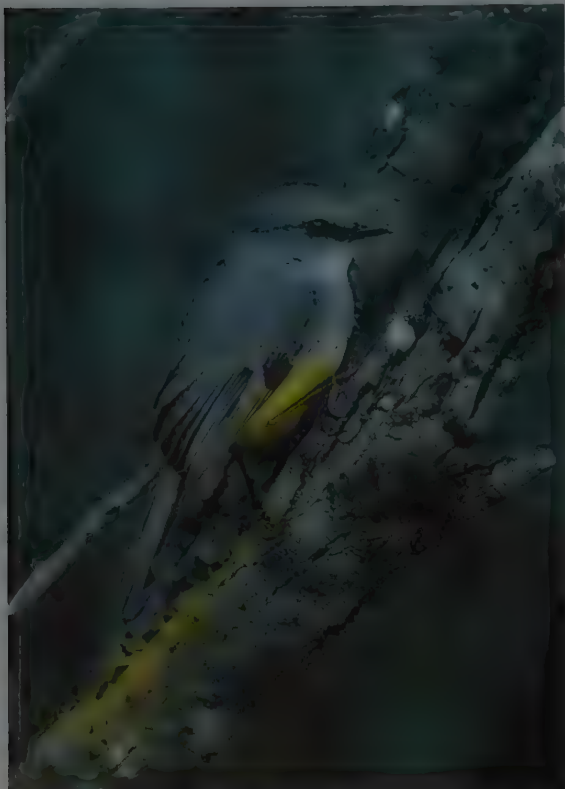
among the robins. Even within this family its generic placement has been debated, and it has been included variously in *Poecilodryas*, in *Eopsaltria* and in the monotypic genus *Peneoenanthe*. Lacking obvious wingbars and pale eyebrows, and having streaked juveniles, it exhibits little to associate it with *Poecilodryas* other than its moderately robust bill. It possesses outward similarities to the White-breasted Robin in adult and juvenile plumages, but it also has its own unusual characteristics among the robins, such as a rounded tail. Despite some reports to the contrary, the Mangrove Robin does, like other members of the subfamily Eopsaltriinae, have a wingstripe, although this is con-

The two species in the genus *Tregellasia* are considered to form the morphological bridge between the *Poecilodryas*/Heteromyias group and the *Eopsaltria* yellow robins, into which *Tregellasia* were formerly lumped. *Tregellasia* robins, including the **White-faced Robin**, share the rufous juvenile plumage of *Poecilodryas* and *Heteromyias*, but have adult plumage characteristics closer to *Eopsaltria*. These include yellowish underparts merging into a white throat, lack of a prominent supercilium and wingbars, and an unmarked olive mantle and tail.

[*Tregellasia leucops albifacies*, Sogeri Plateau, SE New Guinea.  
Photo: Brian J. Coates]







siderably reduced. While there is no reason to doubt a relationship with *Eopsaltria*, the Mangrove Robin is not necessarily closer to those species than are members of the genera *Melanodryas* or *Peneothello*, and it is probably best retained in its own monotypic genus, *Peneoenanthe*.

The four species in *Peneothello*, confined to New Guinea, are all dark-plumaged birds. The blue-grey Slaty Robin (*Peneothello cyanus*) and Smoky Robin (*Peneothello cryptoleuca*) form a species pair, although they occur sympatrically in western New Guinea. There is also considerable overlap between these and the two largely black-plumaged species, the White-rumped (*Peneothello bimaculata*) and White-winged Robins (*Peneothello sigillata*). These species have similar shapes and juvenile plumages, although there has not yet been a rigorous assessment of whether they form a monotypic assemblage within the eopsaltriines.

Nowadays generally treated as congeners, the Hooded Robin (*Melanodryas cucullata*) and the Dusky Robin (*Melanodryas vittata*) were formerly kept in separate monotypic genera until it was recognized that the latter was a hen-plumaged, insular vicariant of the former. Although many authors included these two species in their own genus, *Melanodryas*, others placed them in *Petroica*. The Hooded Robin bears some resemblance to the latter genus in its sexual dimorphism, the black-and-white plumage of the male and the white patterning in the wing and tail, but *Melanodryas* species differ in their body postures, in lacking a frontal spot and in having no red in the plumage; they also have juveniles, nests and eggs, and skull characters that are unlike those of *Petroica* but similar to those of some other eopsaltriine species. A case could perhaps be made for expanding *Eopsaltria* to include this species pair.

The third subfamily is Petroicinae, which Schodde and Mason regarded as containing *Petroica*, *Eugerygone*, *Microeca* and *Monachella*, and which herein has been provisionally stretched to include the enigmatic *Pachycephalopsis*. The first of these genera is the largest in the family. Its eleven species form a cohesive group, all members of which, other than two melanistic forms with all-black plumage, are united by the possession of a prominent forehead spot, this being red in one species and white in the others. The males of most also have red, orange or pink on the underparts, almost the only occurrence of these colours in the

Petroicidae. The females are much duller and exhibit, at most, just a wash of this colour; outside the genus *Petroica*, only two species in this family show sexual plumage dimorphism. There is usually white, often extensively so, in the tail, and the wing has a white stripe and often a white shoulder blaze. Juveniles are streaked. The nests of the *Petroica* robins are rather delicate cups, and the eggs are grey or white with grey or greyish-brown spots. In addition, members of this genus have the habit of drooping and flicking the wings. A systematic review of relationships within the genus has not been undertaken, but several subgroups present themselves.

By far the largest-bodied members of this genus are the New Zealand Robin (*Petroica australis*), which is about three times the mass of the sympatric Tomtit (*Petroica macrocephala*), and the melanistic Black Robin (*Petroica traversi*) of the Chatham Islands. Their distinctiveness was previously recognized by their being segregated in their own genus, *Miro*, but they exhibit typical *Petroica* characters, such as the white forehead spot, and are best retained in *Petroica*. The Black Robin has long been considered an insular derivative of the New Zealand Robin, both having arisen from an earlier colonization of New Zealand, but recent molecular work, while not conclusive, suggests that the Black Robin may instead be closer to the Tomtit.

The Tomtit is part of a group of species that includes the Scarlet Robin (*Petroica boodang*) of Australia and the Pacific Robin (*Petroica multicolor*) of the south-west Pacific islands. It differs from these in having lost most or all of the ventral red coloration, but otherwise is very similar. The population on the Snares Island, subspecies *dannefaerdi*, is entirely black. Molecular studies show that this and other subspecies of the Tomtit are comparatively recently diverged. In contrast, the North and South Island populations of the New Zealand Robin have been separated for a much longer period and should probably be treated as distinct species.

As conventionally treated, the Scarlet Robin extends from Australia to Norfolk Island, off the east coast, and through the south-west Pacific from the Solomon Islands eastwards to Samoa. A more recent treatment has split the island forms from those of mainland Australia. The island part of this split, the Pacific Robin, is distinguished by the reduced amount of white on the forehead, wing and tail, the browner plumage of the female, the more rounded wing and, except for the Norfolk Island population, the smaller size and shorter tail. This taxonomic split may not have gone far enough. In overall proportions, the Norfolk



The genus *Eopsaltria* comprises the four yellow robins, not all of which live up to the name. The Eastern Yellow Robin (*E. australis*) and Western Yellow Robin were previously thought to be conspecific but are now treated as an allopatric species pair. Their close links are very apparent: they are morphologically similar, differing principally in the extent of grey on the breast. In addition, the Western reacts aggressively to playback of the Eastern Yellow Robin, although the reverse experiment has not been tried. It is thought that the Western Yellow Robin may have evolved through a westward invasion of eastern birds, and their subsequent isolation.

[*Eopsaltria griseogularis rosinae*, Manmanning, Western Australia, Australia.  
Photo: Graeme Chapman]

Few petroicids have had as varied a taxonomic history as the Mangrove Robin. The species has been shunted between families—from whistlers (*Pachycephalidae*) through shrikes (*Laniidae*) to Australasian robins. Once in Petroicidae, the Mangrove Robin was placed in *Eopsaltria*, then *Poecilodryas*, until finally being given its own monotypic genus. This makes sense as it differs from other family members in its unique habitat preference of mangroves, its rounded rather than square-ended tail, and the pronounced terminal hook to its bill.

[*Peneoenanthe pulverulenta cinereiceps*, Point Sampson, Western Australia, Australia.  
Photo: Graeme Chapman]



Island population is more similar to the Tomtit than it is to the eastern populations of the Pacific Robin, those of Melanesia and Polynesia. Since the colonization route from New Zealand to Norfolk Island, Vanuatu and the Solomons has been travelled by several unrelated groups of taxa, a relationship between the robins of Norfolk Island and New Zealand would not be unexpected. Whether this relationship is closer than was previously believed, having been somewhat obscured by the loss of red in the Tomtit's plumage, needs to be scientifically tested, as does the possibility that the Norfolk Island population is specifically distinct from those of the northern islands. This form is distinctive in its long, slender bill, its large size and the loss of most of the white in the wing and tail.

Together, the Scarlet and Pacific Robins and the Tomtit form a closely knit group. Allied to this is the Red-capped Robin (*Petroica goodenovii*), an inhabitant of semi-arid and arid regions of Australia. It is markedly smaller than the Scarlet Robin, with which it is sympatric through extensive parts of the latter's range. There are rare records of hybridization between these two species in the wild. Another species that may belong to this group is the Alpine Robin (*Petroica bivittata*), one of two *Petroica* robins that inhabit high altitudes in New Guinea. This species also lacks red in the plumage, but its black coloration is more reminiscent of the members of this group than it is of other congeners. There are, however, substantial differences in its foraging habits. The other high-elevation species is the more restricted Snow Mountain Robin (*Petroica archboldi*), which occurs above the timberline. It is a distinctive member of this genus, but a very poorly known one, and little has been recorded about its natural history or relationships.

Another group in *Petroica* consists of the pink-breasted species. The Rose Robin (*Petroica rosea*), which occurs in the south-east and east of the Australian mainland, is closely related to the Pink Robin (*Petroica rodinogaster*), which has its stronghold in Tasmania. Although these two are sometimes cited as forming a superspecies, they are not geographical replacements of each other, as they overlap in range in the extreme south-east of Australia. In addition, the two differ in foraging behaviour and cannot be regarded as ecological counterparts. Finally, the Flame Robin (*Petroica phoenicea*) also stands alone in the genus, the grey back and bright orange underparts of the adult male offering few clues to its affinities.

The genus *Eugerygone* contains a single species, the Garnet Robin (*Eugerygone rubra*) of New Guinea. Because of its super-



ficial resemblance in appearance and foraging behaviour to various members of Acanthizidae, it was long considered to belong there, and indeed was formerly placed in the genus *Gerygone*. The Garnet Robin is now recognized as being closely allied with *Petroica*, and is the only other member of the present family with red in the plumage. It further resembles *Petroica* species in its white forehead spot and its wing and tail patterns, its sexual dimorphism, and its wing-flicking habit.

Six species of *Microeca* are currently recognized. These lack markings on the face, wing and tail, as well as having no red in the plumage. Members of this genus are the most aerially foraging of all petroicid robins, and this is reflected in the morphology of the bill and legs. They were once placed close to the Old World flycatchers, to which they exhibit a strong resemblance in external appearance. Species of *Microeca* are quite different from *Petroica* in having spotted juvenile plumages, a character that contributed to their placement with the muscicapines. There are also differences in the eggs, but more strikingly distinct is the small flat nest.

Although *Microeca* appears to represent a natural group, relationships among its members are not clear. The Tanimbar Flyrobin (*Microeca hemixantha*) was thought to be closest to the Canary Flyrobin (*Microeca papuana*), based on similar intense yellow plumages, but it is now regarded by many as a brighter island representative of the widespread Lemon-bellied Flyrobin (*Microeca flavigaster*). The mangrove-inhabiting taxon *tormenti* of coastal north-western Australia was maintained as a distinct species, the "Brown-tailed Flycatcher", until evidence of intergradation with the Lemon-bellied Flyrobin was discovered in a narrow zone in the Cambridge Gulf, leading to the two being merged. Nevertheless, because the habitat preferences of these two forms are quite different, and the area of hybridization restricted, the situation warrants re-examination. The Yellow-legged Flyrobin (*Microeca griseiceps*) and the Olive Flyrobin (*Microeca flavovirescens*) are widespread in New Guinea, and co-exist with several congeners. The largest and most distinctive member of the genus, however, is the Jacky Winter (*Microeca fascians*). This species lacks any yellow pigmentation in the plumage, and it obtains a large proportion of its prey in a much more robin-like manner, by pouncing, rather than flycatching.

Closely related to *Microeca* is the distinctive Torrent Flyrobin (*Monachella mulleriana*), sole member of its genus. It differs



The genus *Peneothello* comprises two dark-plumaged species pairs endemic to New Guinea. All species in the quartet have dark adult plumages, and similar juvenile plumages, and shapes. Two species have black plumage with contrasting white patches, the locations of which are enshrined in their English names: the White-rumped Robin (*P. bimaculata*) and White-winged Robin. The four species occur sympatrically but are separated altitudinally, with the White-winged occurring highest. All four species inhabit rainforest undergrowth, where they sally-strike and glean insects.

[*Peneothello* *sigillata* *hagenensis*, Mt Hagen, E New Guinea. Photo: Brian J. Coates]

Now treated as each other's lone congeners, the Dusky Robin (*Melanodryas vittata*) and Hooded Robin have previously been lumped with *Petroica*. The Hooded Robin shows similarities to *Petroica* in its black-and-white male plumage and sexual dimorphism, both illustrated here. However, the genera differ in juvenile plumage, nest, egg and skull characteristics. The two *Melanodryas* are allopatric, and recent work has revealed that the Dusky Robin appears to be a female-plumaged island derivative of the Hooded Robin.

[*Melanodryas cucullata* *cucullata*, Hattah-Kulkyne National Park, Victoria, Australia. Photo: Andy & Gill Swash]





As their generic name suggests, the two large-bodied, dull-coloured species in the genus *Pachycephalopsis* have previously been linked with the whistler family (*Pachycephalidae*), and were once even housed in the main whistler genus *Pachycephala*. Although the Green-backed Robin (*P. hattamensis*) and **White-eyed Robin** are now tentatively placed within *Petroicidae*, the suite of morphological and other characteristics used to identify intra-family relationships do not obviously link *Pachycephalopsis* to any other petroicid genus. Both *Pachycephalopsis* inhabit the thick undergrowth and floor of hill forest and lower montane forest in New Guinea. The rounded wingshape of the White-eyed Robin, as seen here, is an adaptation to understorey life, where there is no need for the long, pointed wings that help birds fly long distances. The *Pachycephalopsis* species pair is a good demonstration of altitudinal separation amongst congeners: where the two species meet, the Green-backed Robin is forced uphill.

[*Pachycephalopsis poliosoma hunsteini*, Heroana, EC New Guinea.  
Photo: William S. Peckover]

One of three monotypic genera in Petroicidae, the **Garnet Robin** is endemic to New Guinea. Because of its warbler-like appearance and foraging behaviour, the species was formerly placed in the genus *Gerygone*, in the family Acanthizidae. However, close affinities between the Garnet Robin and the genus *Petroica* are demonstrated by certain shared behavioural traits, such as wing-flicking; and external morphological characteristics, such as the vertical white wing mark, red in the plumage, the white forehead spot, the tail pattern, and sexual dimorphism.

[*Eugerygone rubra* saturation, Crater Mountain, EC New Guinea. Photo: William S. Peckover]



from *Microeca* in its preference for streamsides and in its black, grey and white plumage, but otherwise there is little to separate the two. Behaviourally, too, they are very similar, and a case could be made for merging the genus *Monachella* with *Microeca*.

*Monachella* is the only member of the family that is known to occur on New Britain, in the Bismarck Archipelago. There may, however, be an as yet undescribed species of *Microeca* also living there. Several reports in recent years, from both New Britain and New Ireland, have described a bird similar to the Yellow-legged Flyrobin and which apparently spends much of its time in the canopy. Confirmation of the existence in Bismarck of an undescribed petroicid species would be a remarkable event.

One character that unites the members of the subfamily Petroicinae is the absence of a forward-pointing projection on the vomer. Otherwise, there seems little to associate *Petroica* and *Eugerygone* with *Microeca* and *Monachella*. The latter two genera differ from all other robins in several characters and appear to warrant separation at subfamily level.

It is uncertain with which group *Pachycephalopsis* is best associated. Its two species, the White-eyed (*Pachycephalopsis poliosoma*) and Green-backed Robins (*Pachycephalopsis hattamensis*), are large-bodied, dull-coloured birds. At one time they were associated with the whistler genus *Pachycephala*, and were sometimes even placed in it. In fact, most of the characters that have been used in the generic classification of petroicid robins do not obviously place *Pachycephalopsis* near other genera. A possible connection with the subfamily Petroicinae has been suggested, and is provisionally followed herein.

### Morphological Aspects

Most species of Australasian robin are somewhat rotund and stocky, with a large and rounded head and rather big eyes. The main variation among them involves plumages and differing proportions of body parts in those taxa adapted for thrush-like, warbler-like or flycatcher-like lifestyles.

The bill is straight, and of short to moderate length. Attesting to the insectivorous habits of this family, the upper mandible is hooked to varying degrees and has a subterminal notch. The bill of the Scarlet Robin is quite short, about 12 mm, while that of the scrub-robins, the White-eyed Robin, the New Zealand Robin and the Black-throated Robin is about 20 mm long. It is usually thin,

the width being equivalent to about 30–35% of the length. Species that feed primarily by aerial capture of flying insects have a broader, flatter bill; the bill width of the Yellow-legged Flyrobin, for example, is 45% of the bill length. The largest bill in the family is that of the Black-throated Robin; not only is it the longest, at around 23 mm, but it is also the widest, being about 10 mm broad, a reflection of the species' flycatching habits. The Mangrove Robin has a slim but strong bill, with a more pronounced terminal hook than that of most species. This may be correlated with its often more robust prey. It also has well-developed rictal bristles. Such bristles are conspicuous in most members of the family, and particularly so in the case of those which specialize in aerial flycatching.

Development of the legs also correlates with a bird's habits. Most of the Australasian robins have a moderately long and slender tarsus, but those that spend much of their time on the ground, such as the scrub-robins and the New Zealand Robin, possess thicker and longer legs, corresponding to 38–47% of the wing length, with stronger toes. At the other end of the continuum, the species that practise aerial flycatching have proportionately short legs, 15–18% of the wing length, and small feet. The majority of petroicids have legs 23–28% as long as the wing. The tarsus is scutellate in almost all of these species, the booted condition exhibited by the Grey-headed Robin being one of the few exceptions.

All members of the family have ten functional primaries and nine secondaries, the latter including three tertials. The shape of the wing, determined by which of the primaries is the longest, varies in relation to the degree of aerial or terrestrial behaviour and the denseness of the vegetation that the bird frequents. Most species have primary P7 the longest, followed closely by primary P6. In the case of the aerially flycatching Jacky Winter and other *Microeca* species, the longest primary is P8, producing a more pointed wing. This is also the longest primary in the open-country Hooded and Red-capped Robins. The terrestrial scrub-robins, on the other hand, have a more rounded wing, with P6 the longest primary, and this roundedness of the wing is even more pronounced in the White-eyed Robin, which lives in thick vegetation near the ground and has primary P5 as the longest. No robin undertakes movements of such uninterrupted duration that



The largest genus in the family is *Petroica*, with 11 species including the **New Zealand Robin**. Genus members have some common plumage characteristics, such as a forehead spot, white wingbar and white in the tail. The New Zealand Robin, the heaviest member of the genus, is unusual for the genus in that the male lacks brightly coloured underparts. Most Australasian robins have fairly long, slender legs, but those of the New Zealand Robin are notably long and thick—an adaptation to its predominantly terrestrial lifestyle, particularly on small islands.

[*Petroica australis*, Boyle River Valley, South Island, New Zealand. Photo: Andy Trowbridge]



they exert an influence on wing shape. There are, for example, differences in wing shape between the highly migratory Flame Robin and the closely related but more sedentary Scarlet Robin.

The tail is short to moderately long, generally corresponding to 70–80% of the wing length. A few species, such as the Olive-yellow Robin and White-rumped Robin, have a markedly short tail, measuring 60% or less of the wing length. At the other end of the range are the particularly long tails of the *Drymodes* scrubrobins, that of the Southern Scrub-robin being about 10% longer than the wing. The tip of the tail is square except in the case of the Mangrove Robin, in which it is rounded. All petroicids have twelve rectrices.

Adults are usually olive, grey, brown or black above, usually without markings, and occasionally with a contrasting rump. The underparts are frequently more colourful, sometimes brightly so. A common colour pattern is characterized by a yellow ventral surface with a diffuse and indefinite transition to an off-white or pale grey throat, and a grey or grey-brown crown, yellow-green or olive dorsum, and olive-grey or brownish-olive wings and tail which lack contrasting markings. This pattern becomes variously modified, including the acquisition of a discolorous rump or breastband, different colours of the crown and dorsal surfaces, and increased definition of the transition between the throat and the breast. Within the Petroicidae, this pattern is found in several genera: it is displayed by the Eastern and Western Yellow Robins and the Yellow-bellied Robin in the genus *Eopsaltria*, by the Olive-yellow Robin in *Poecilodryas*, by both of the *Tregellasia* species, by the Green-backed Robin in *Pachycephalopsis*, and by the Yellow-legged and Olive Flyrobins in *Microeca*. These species resemble some of the smaller members of the family Pachycephalidae, such as the Vogelkop Whistler (*Pachycephala meyeri*) and the Yellow-bellied Whistler (*Pachycephala philippinensis*). The petroicid species that possess a breastband or a pronounced, though not sharply delimited, grey breast lack the well-defined demarcation of plumage colours exhibited by the Golden Whistler (*Pachycephala pectoralis*) group.

Another frequent colour combination is black, grey and white, although the patterns are quite varied and cross several generic lines, being found in *Petroica*, *Monachella*, *Eopsaltria*, *Peneonanthus*, *Melanodryas* and *Peneothello*. Two insular populations, namely the Black Robin of the Chatham Islands and, south-west of there, the Snares Islands subspecies of the Tomtit, are completely black. This melanistic plumage conceals the distinctive pattern that characterizes other species of *Petroica*, adult males



Adult males of most *Petroica* robins have vivid red, orange or pink on the underparts. One member of the group of pink-breasted species is the appropriately named **Rose Robin**. Occurring mainly in the south-east of mainland Australia, it is closely related to the Pink Robin (*P. rodinogaster*), which has its stronghold on the island of Tasmania. The two species overlap in range in extreme south-east Australia, where they are ecologically separated by the Rose Robin's preference for feeding higher up in trees than its congener.

[*Petroica rosea*,  
Helensburgh,  
New South Wales,  
Australia.  
Photo: Chris Ross]

of a number of which have vivid red, orange or pink on the underparts. In most members of this genus, both sexes have a spot on the forehead at the base of the upper mandible, white on males and pale buff on females. The two all-black forms lack this spot, and a further exception is provided by the Red-capped Robin, in which the pale spot is replaced by an enlarged red patch. Even among those species that have the bright underpart colour reduced, or have lost it altogether, their generic affinities are clear. Apart from *Petroica*, the only petroicid with red in the plumage is the Garnet Robin, the sole member of the genus *Eugerygone*.

Other than lacking red and orange, the genus *Poecilodryas* encompasses most of the range of colour combinations found in the Petroicidae. Its six species present plumage colorations of black and white, or black, white and buff, or yellow, olive and grey, or blue, black and white, the last-mentioned being a unique combination within this family.

Patterning of the plumage, particularly on the face, wing and tail, is variable through the family. Some members, such as most species of *Microeca* and *Pachycephalopsis*, lack markings altogether and have little more than variations in shading across the body and face. Facial markings include the forehead spots of *Petroica* and the Garnet Robin, mentioned above, and expanded forehead and loreal spots which combine to produce the extensively pale face of the White-faced Robin and the Torrent Fly-robin. A pale, diffuse, barely contrasting supercilium is possessed by the Eastern Yellow Robin and Grey-headed Robin, among others. In the latter species, this contributes to a muted tortoiseshell patterning on the head. Eyebrows that are strongly differentiated from the face are exhibited by the White-browed, Black-sided, Black-chinned and Ashy Robins and the Northern Scrub-robin.

Within the Australasian robins, a wingstripe across the bases of the remiges is characteristic of all genera except *Pachycephalopsis*, *Microeca* and *Monachella*, and is lacking also in one species of *Eopsaltria*, the Yellow-bellied Robin of New Caledonia. The stripe is usually not visible on the folded wing, appearing only when the bird is in flight. It can be rather obscure, as in the Mangrove Robin, or very pronounced, as in the Hooded and White-browed Robins and several of the *Petroica* robins. Some species also have wingbars visible on the folded wing. This is usually a single bar, as in the Black-sided Robin, but occasionally a double one, as exhibited by the Northern Scrub-robin. Additions or extensions to this marking may be formed by pale patches on the bases of the remiges, or pale edges and tips on the

The males of all bar one race of the **Tomtit** of New Zealand have a black head and upperparts, white forehead spot and wingbar, and yellow underparts. The race *dannefaerdi* from the Snares Islands is the striking exception, being entirely black. This plumage anomaly recalls the Black Robin (*Petroica traversi*), which is often reckoned to be the melanistic island derivative of the New Zealand Robin (*P. australis*). Some believe that if these two are treated as separate species, it would be consistent to elevate the black form of the Tomtit to the rank of a full species.

[*Petroica macrocephala dannefaerdi*,  
Snares Islands,  
New Zealand.  
Photo: Tui de Roy/  
The Flying Tortoise]



The six species of *Microeca* differ from most other family members in their propensity for flycatching. This is reflected in distinct morphological attributes. The **Olive Flyrobin** and its congeners have a broader, flatter bill, longer, more pointed wings and proportionately shorter legs than other petroicids. *Microeca* were once placed close to Old World flycatchers (*Muscicapidae*), which they resemble in external characteristics. Within the context of *Petroicidae*, so distinct are these species that *Microeca* and its sister genus *Monachella* may merit their own subfamily.

[*Microeca flavovirescens* *cuicui*, Port Moresby, Papua New Guinea. Photo: Roland Seitre]



tertils. In species such as the Flame, Scarlet and Red-capped Robins, these combine to form a white stripe along the upper surface of the wing, which in these examples merges with an extensive white patch towards the bend of the wing.

A number of robins have a uniformly coloured tail, while several members of the family have a thin terminal tailbar, present only when the rectrices are fresh. A few, however, display a strongly marked tail pattern. The Garnet Robin and most of the *Petroica* species have some degree of white in the tail, this being generally restricted to the outer two or three feathers and entirely absent from the central pair. The Jacky Winter has prominent all-white outer feathers, the Mangrove Robin has the basal portion of the tail white, and the Hooded Robin combines a white base with extensive edging on the outer rectrices.

Sexual dimorphism is found in some species with bold plumage patterns, such as the Flame and Scarlet Robins and several other *Petroica* species, and the Hooded Robin. This is not a regular phenomenon, however, as other strongly patterned species, such as the Buff-sided Robin, Grey-headed Robin and Northern Scrub-robin, are sexually monomorphic. A number of species exhibit a difference in size between the sexes.

Interestingly, the island populations of the Pacific Robin exhibit various degrees of sexual dimorphism. Those on Norfolk Island show strongly pronounced differences between the male and the female, similar to those demonstrated by the Scarlet Robin of Australia, as do populations on several other islands. Of the five subspecies occurring in Vanuatu, two display similar degrees of dimorphism, but the other three have males that more closely resemble females in plumage. In the Solomon Islands, one population, the San Cristobal subspecies *polymorpha*, has two male plumages: one has a black head like those of Norfolk Island, whereas the other has a female-like, rusty-brown head. Females in Samoa have a more male-like plumage than is found in other races.

Petroicid robins are unusual among Australasian passerine families in that the juvenile plumages, rather than being duller versions of the adult plumage, are markedly different from them. The robins have three main types of juvenile plumage, which can be generalized as, respectively, unmarked, streaked and spotted.

In the unmarked plumage type, the body feathers are uniformly coloured, without streaks or pale tipping. Such juveniles are most often rufous or brick-red, occasionally darker brown, and in two melanistic forms sooty black. The upperwing-coverts lack pale tips. This plumage type is found in the genera

*Poecilodryas*, *Heteromyias* and *Tregellasia*, and is presented also by the Northern Scrub-robin, the Black Robin and the Snares Islands race of the Tomtit. The unmarked rufous juvenile is an unusual condition, not only in the Australo-Papuan passerines, but among the passerines worldwide. Indeed, it is shared only with the pachycephalid whistlers. Rufous *Tregellasia* juveniles frequently show slight streaking, usually limited to the crown or, occasionally, some secondary coverts. The juvenile White-eyed Robin has undergone changes from the generalized unmarked condition; while conforming more or less to this description, it exhibits more mottling and does not vary extensively from the rather plain adult plumage.

The most widely distributed juvenile pattern is the streaked plumage, characterizing the young of such species as the Eastern Yellow Robin. The central feather shaft and the surrounding basal sections of the barbs are paler than the remaining portions of the web, producing a streaked appearance. The feathers may be primarily rufous, light brown or dark brown, and the streaking varies from being fine, as produced by a narrow centre of paler colour, to being coarse, with a wide pale centre. The upperwing-coverts are usually tipped with the same pale colour as the centre shafts. Streaked juveniles are characteristic of the Southern Scrub-robin, the Mangrove Robin, the Garnet Robin and members of the genera *Eopsaltria*, *Peneothello*, *Melanodryas* and *Petroica*.

Juveniles of the Garnet Robin and of most *Petroica* species are finely streaked, while *Eopsaltria*, *Peneothello* and *Melanodryas* are much more broadly so. The scrub-robins are unusual in that juveniles of one of the two species, the Northern Scrub-robin, have unmarked rufous plumage whereas those of the other, the Southern Scrub-robin, are coarsely streaked. Dark, coarsely streaked juvenile plumage is a feature not only of the last-mentioned species, but also of the Red-capped, Hooded and Dusky Robins. There may a relationship between this coarser patterning and the birds' habitat, because the first three are the species most adapted to semi-arid environments in Australia. This is not, however, the case with the Dusky Robin, which is an inhabitant of humid Tasmania.

In the third and final type of juvenile plumage, the spotted pattern, the darker feathers of the dorsal surface have pale, slightly rounded tips and, conversely, the pale feathers of the underparts have darker tips. The wing-coverts are tipped in the same manner. Rufous is absent from the plumage. This type of juvenile plumage is restricted to *Microeca* and the Torrent Flyrobin, and shows no



There is a good case for merging the monotypic genus *Monachella* with the closely-related *Microeca*. Whilst *Monachella*'s sole member, the **Torrent Flyrobin**, differs from *Microeca* in its striking pied plumage and predilection for streamside forest, the two genera are similar in terms of morphology and behaviour. The **Torrent Flycatcher** is unique in *Petroicidae* for such a striking habitat specialization. Living along the borders of fast-flowing streams, it uses rocky edges and boulders as a base from which to make aerial sallies.

[*Monachella muelleriana* *muelleriana*, Laloki River, SE New Guinea. Photo: Brian J. Coates]





Frequent bathing helps birds keep their feathers in excellent condition. Once in the water, a bird will fluff its feathers to expose the bare skin between the feather bases, submerge its breast and belly, dip its head in the water, roll vigorously back and forth, and create a shower by flicking its wings in and out of the water. The bird repeats the sequence, submerging further each time until all feathers are soaked. This **Black-sided Robin** has just shaken off the excess water after bathing, vibrating its wings and tail and ruffling its feathers, and is now having a good stretch to help get its feathers back into position. This stretch conveniently reveals the prominent white wing band common to most *Poecilodryas* robins.

[*Poecilodryas hypoleuca hypoleuca*, Brown River, SE New Guinea. Photo: Brian J. Coates]

obvious relationship to any of the other plumages. A few Australasian families, including the woodswallows (Artamidae) and the sittellas (Neosittidae), have spotted juveniles, but the resemblance between these and the spotted robins appears superficial.

All members of the family, shortly after fledging, appear to undergo a partial post-juvenile, or first pre-basic, body moult, during which the flight-feathers, the wing-coverts and the tail feathers are retained. Males of sexually dimorphic species exhibit delayed plumage maturation, in that the plumage acquired through this moult resembles that of the female. This may not, however, be a clear-cut event. About a third of young Hooded Robin males gain an adult plumage at this moult, while the remainder have a hen-type plumage for a further year. Immatures can be recognized by their retained juvenile wing-coverts, regardless of the body plumage that has been acquired. As a rule, once the adult plumage is attained, a single complete annual moult takes place, with no subsequent change in appearance. There is evidence that the New Zealand Robin may require several moults before reaching its definitive adult plumage. Some older female Flame and Red-capped Robins develop an orange or reddish wash on the underparts, which is not present on younger adults. As with many Australasian passerines, a prolonged breeding season can complicate matters if moults are started and then stopped between successive nesting attempts.

Little work has been done with regard to either descriptive or comparative osteology of the Petroicidae. The tricipital fossa of the humerus is single and pneumatic. The postorbital and zygomatic processes are small, as is the ectethmoid. Two characters that were used by Schodde and Mason in discerning subdivisions in this family (see Systematics) are the condition of the vomer and the temporal fossa. In some taxa, the vomer has two large, dorsoventrally flattened, forward-pointing horns; other taxa have these horns very reduced or absent. In the subfamily Eopsaltriinae, the temporal fossa is expressed in two states, one being clearly outlined, with a distinct crest demarcating the posterior border, and the other being larger and more diffusely defined. The former characterizes members of the genus *Eopsaltria*, whereas the latter is found in species of *Poecilodryas*.

## Habitat

All members of this family occur in timbered habitats, but the nature of these varies considerably among species. Collectively, however, they can be found in most wooded areas, ranging from arid zones to rainforest, and at most elevations.

Most of the robins in New Guinea are birds of the rainforest. Each species is restricted to a particular altitudinal zone, no single species occurring across a range of elevations from the coast to the highlands. Although found in rainforest, the Torrent Fly-robin has a specialized habitat: it lives along the edges of fast-flowing streams with rocky edges and protruding boulders from which it can hunt. Exceptions among New Guinea petroicids are the Jacky Winter and the Lemon-bellied Flyrobin, both of which occupy savanna woodland, as they do also in northern Australia. Another shared species that lives outside rainforest is the Mangrove Robin, which is almost entirely restricted to the habitat after which it is named. Two other robins, the Tanimbar Flyrobin and the "Brown-tailed" subspecies *tormenti* of the Lemon-bellied Flyrobin, are also found in mangroves, the latter almost exclusively so.

The Petroicidae occupy a much wider habitat range in Australia. There are rainforest species, such as the White-faced Robin, Yellow-legged Flyrobin and Northern Scrub-robin, which occur also in New Guinea, and the Grey-headed Robin, which is confined to north-east Australia. At the opposite end of the spectrum are the Red-capped and Hooded Robins, which have penetrated into the central arid zone. Most Australian species show a broader range of habitats, often frequenting ecotones between wetter and more open forests and woodlands, many of the latter dominated by eucalypts (*Eucalyptus*). Several species exploit the ecotone between timbered habitat and farmland or grazing land. The broadest range of habitats is that of the Eastern Yellow Robin. Along the east coast, this species occurs in rainforest, and in both wet and dry sclerophyll forest; it extends also as far west as central New South Wales, where it can be found in semi-arid woodland. Some species exhibit seasonal changes in habitat. The Flame Robin, for example, moves from higher-elevation forest, where

This **Hooded Robin** is taking time out from foraging to preen, an activity that is particularly important in its dusty, semi-arid habitat. Birds preen to repair feathers, nibbling with the bill to straighten the feathers, reattaching the barbules and mending the splits.

Birds also preen to waterproof and recondition feathers, using the bill to pick up uropygial oil from the preen gland near the base of the tail and then rubbing this over the feathers. Uropygial oil is thought to have antibacterial, antifungal and antiparasitic properties that inhibit parasites, so preening also plays a role in removing harmful organisms from the plumage.

[*Melanodryas cucullata cucullata*,  
Goschen, Victoria,  
Australia.

Photo: Peter Fuller]



it breeds, to more open country at lower altitudes in the non-breeding season. Such shifts are known to be made by several other species, but none changes its habitat so prominently as does the Flame Robin.

In the main islands of New Zealand, the Tomtit and the New Zealand Robin live in native forests, particularly those of *Nothofagus* beech, podocarps or combined associations. In a few areas, they occur also in coastal scrub and subalpine shrubland, where there are few trees. Likewise, on the Auckland Islands and Snares Islands, the Tomtit occupies tussock grassland with scattered scrub. This species, as the Flame Robin in Australia, has successfully invaded exotic pine (*Pinus*) plantations. Several members of the family also recolonize regrowth native forest following logging or fire, once a suitable understorey has developed.

Altitudinal zonation in New Guinea is well documented. As with many bird species on this island, any particular robin occurs between fairly well-delimited upper and lower elevations, although the precise limits may vary locally. The Black-sided Robin lives in the lowlands and lower hills, the White-faced Robin inhabits middle elevations, and the Lesser Ground-robin, Ashy Robin and Black-throated Robin occupy higher elevations. In the Oranje Mountains, the Snow Mountain Robin occurs above the timber-line, higher than 3850 m, where it lives on bare rock slopes and cliffs, and forages among boulders on talus slopes.

At any particular site, several species of Australasian robin may co-occur. These assemblages comprise species which differ from one another in size, foraging mode and feeding-height preferences. A phenomenon that has intrigued ornithologists for some time is the distributional pattern in which several petroicid species of similar sizes and foraging habitats replace each other at progressively higher elevations. Some New Guinea robins are absent from seemingly suitable localities, and it may be that these have been excluded by competition with related forms of similar size and feeding habits. Elsewhere, they may co-exist with larger-bodied or smaller-bodied species or with those that forage in different strata of the forest. In the Eastern Highlands, three fairly common species have rather sharply defined altitudinal zones,

without overlapping. Thus, the White-eyed Robin is found at elevations of about 900 m to 1500 m, while at high altitudes, 2200–3350 m, the White-winged Robin occurs; between them, at 1500–2200 m, lives the Slaty Robin. A fourth species, the Black-sided Robin, is found in the lowlands, but it reaches its upper limit below the lower level of occurrence of the White-eyed Robin, leaving a gap unoccupied by either. In the genus *Microeca*, two widespread species, the Olive Flyrobin and the Canary Flyrobin, live at the lower and higher elevations, respectively. Where the much more restricted Yellow-legged Flyrobin occurs, it is found in the intervening zone, sometimes in a quite narrow band, but

With their trills, piping notes and whistles, most petroicids are not particularly notable songsters. Nevertheless, the **Lemon-bellied Flyrobin** makes up for this by being one of the loudest and earliest-starting contributors to the Australian dawn chorus. Unlike most robins, this species chooses prominent, elevated song perches from which it indulges in a lark-like display flight, spiralling high, singing continuously, then plunging back towards ground.

[*Microeca flavigaster flavigaster*,  
Darwin, Northern Territory,  
Australia.  
Photo: Peter Fuller]







The flyrobins of the genus *Microeca* catch almost all their prey by flycatching and sally-strikes. The exception is the **Jacky Winter**, a species that obtains more than half of its prey by pouncing, which is a technique more commonly associated with the other genera in the family. The Jacky Winter will sit motionless on a perch and carefully scan the surrounding habitat for signs of movement. Should it not detect any prey, the bird changes perch and repeats the process. Once the bird homes in on a prey item, it drops to the ground, picks up the food, and returns to a perch to eat.

[*Microeca fascians assimilis*,  
You Yangs,  
Victoria, Australia.  
Photo: Peter Fuller]

elsewhere considerably overlapping its congeners. The Slaty Robin and the Smoky Robin are the eastern and western members, respectively, of a species pair. The two occur mainly at 1400–2500 m and are allopatric through most of their ranges; where they do co-occur, in the mountains of Irian Jaya, the western species, the Smoky Robin, lives at the higher altitude. Similarly, the Green-backed Robin of the western half of New Guinea becomes the higher-dwelling species where it meets its sole congener, the closely related White-eyed Robin.

### General Habits

The White-eyed and Green-backed Robins of New Guinea are common but shy inhabitants of the undergrowth. Their secretive, cryptic nature is unusual in the family, most species of which are tolerant of the presence of humans. Indeed, some can be considered tame and confiding. The Eastern Yellow Robin and the Dusky Robin, for example, are notable for the habit of approaching and remaining near people, and an observer can attract the New Zealand Robin by moving noisily through the forest while tapping on a plastic bottle.

A watching robin may remain motionless on a perch for an extended period, before moving to a new, often closer vantage point. The yellow robins and their relatives, in particular, are noted for their common practice of clinging sideways on the trunks of trees when scanning for food or watching a human being. Here, they may hang silently, often unnoticed for some time, or they will scold loudly, often attracting other birds to the spot.

A common posture adopted by species of *Petroica* and the Garnet Robin while perched is to droop the wings, flicking them upwards regularly, which gives a nervous appearance. This practice has earned the Garnet Robin the alternative name of “Fidgeting Flycatcher”. The Tomtit incorporates these actions into its aggressive displays. Its normal posture when perched is to hold the body at an angle of about 45° to the substrate. During displays between males along a territorial boundary, however, each individual raises and slightly spreads his tail, while drooping and partially fanning the wings. The two turn sideways towards each

other and raise their crown feathers, expanding the white spot on the forehead. They alternate this posturing with short flights as they follow each other along the boundary. If this does not prove successful in getting the rival to retreat, the birds adopt much more upright stances, flicking the wings and tail, and face each other about 30 cm apart. Continued aggression leads to chases until one of the Tomsitts departs.

Several species, in addition to the *Petroica* robins, move the tail when perched. Notable among these are the White-browed Robin, which slowly raises and lowers its tail, and the Jacky Winter, which constantly wags it from side to side.

The social organization of several species, especially the Scarlet Robin, Flame Robin, New Zealand Robin, Tomtit and Hooded Robin, has been studied in detail, but most members of the family are much less well known. The majority of petroicids occur in pairs or small family groups throughout the year, although some form flocks in the non-breeding season.

### Voice

Most of the Petroicidae are not noted songsters, although their voices are not unpleasant. On occasion, some are more conspicuous for their enthusiasm than for their musical prowess. The song of the Black Robin has been described as beautiful and crystal-clear. This, however, is an exception among the more typical vocalizations, which include trills, piping notes and whistles.

While Australasian robins are not generally noisy birds, during the breeding season the songs of the Red-capped Robin and Flame Robin become persistent, if not monotonous, parts of their respective environments. These vocalizations are somewhat scratchy, with phrases that resemble the trills of insects or the sound of small pebbles being struck together.

The Eastern Yellow Robin has bell-like notes, as well as two-note “tchop tchop” calls. Its generic name, *Eopsaltria*, means “dawn singer”, an appropriate appellation because this is one of the first birds to call in the morning, beginning up to half an hour before sunrise; it is also one of the last to finish at dusk. Another species that is prominent in the dawn chorus is the Lemon-bel-

lied Flyrobin. As well as one of the earliest to call, it is also one of the loudest of the morning bird songs. Unlike most robins, this species sings from prominent elevated perches near the tops of trees or on overhead wires. Males also perform song flights. They spiral upwards until almost out of sight, singing continuously, and then fold their wings and plummet back towards the ground. The Jacky Winter has a similar display, rising 120-150 m and flying in what has been described as a rather aimless lark-like manner.

Most robins have a range of vocalizations, but the functions of all of these are not always clear, even for those species that have been studied in some detail. Songs may be given throughout the year, but are uttered most frequently during the breeding season. They contribute to territorial advertisement and defence, as well as attracting mates and reinforcing the pair-bond. Petroicids are quite vocal towards perceived threats. They approach and sometimes follow intruders, while giving harsh scolding notes.

Duetting, in which two individuals call back and forth to each other with different songs, was thought to be practised by the Lesser Ground-robin. This species' initial eight-note, largely descending phrase is followed by a different eight-note phrase, which was believed to be emitted by a second individual of the species. It was subsequently discovered, however, that a single ground-robin produced both songs in alternation. A Lesser Ground-robin utters the first phrase, and then moves to a new location and delivers the second phrase. The two songs are alternated as the singer moves, so that it never gives both from the same place.

### Food and Feeding

Australasian robins eat a range of small invertebrates, mainly insects. They consume some small molluscs, too, and the larger-bodied members of the family add small lizards to the diet. The

Mangrove Robin takes small crabs. Berries are eaten on occasion, and they appear to form a significant part of the diet of the New Zealand Robin.

The principal capture technique used by most robins is that of pouncing. An individual bird sits motionless on a perch, while quietly scanning its surroundings. If it does not detect any prey after a period of time, it moves to another perch and there continues the search. When the bird does sight a prey item, it drops to the ground, picks up the food, and returns to a perch to eat it. Pouncing can account for 60% or more of the attack methods of many species, the Grey-headed Robin employing this technique in more than 90% of its feeding attempts. Most species that pounce use perches that are generally less than 2 m from the ground, and perches utilized by the Scarlet Robin are usually below 1 m. The petroicids that feed primarily by pouncing do make some use also of other techniques. They undertake some gleaning from the bark of trunks and branches and, less often, from foliage, and they capture varying amounts of prey in flight, either by making sally-strikes to glean items from leaf surfaces, a technique known also as "flycatch-gleaning", or by seizing aerial insects.

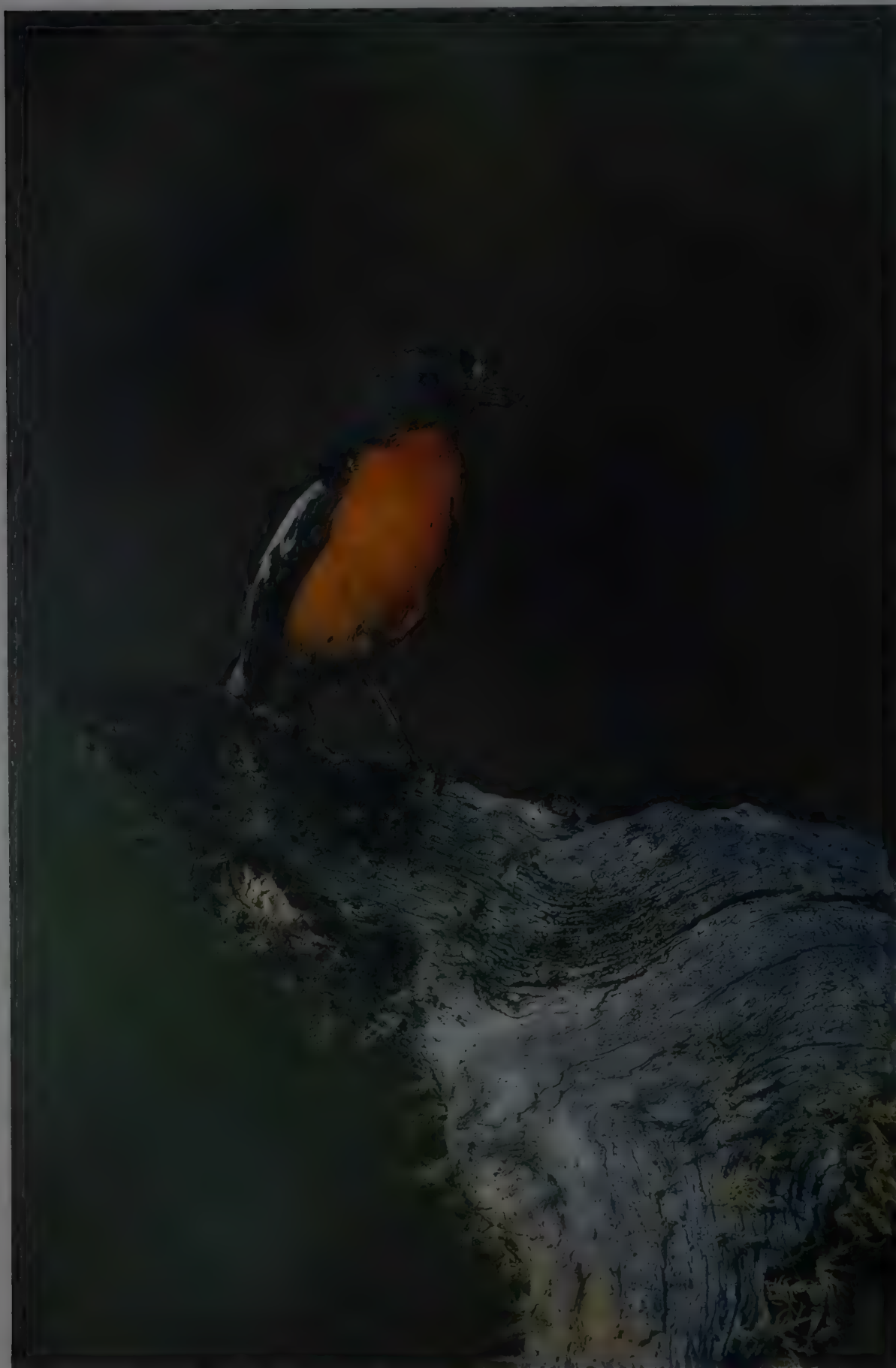
A few members of the family have shifted to other major foraging modes. The Rose Robin flits through the outer vegetation of the canopy in a warbler-like fashion. It acquires most of its food through varying proportions of aerial flycatching, sally-strikes and gleaning, while pouncing makes up, at most, 10% of feeding attacks. The scrub-robins and the New Guinea ground-robins hunt almost exclusively on the ground. They pick prey from the surfaces of leaf litter, but they do not use the bill or feet to turn over leaves. Flycatching and sally-strikes are the major techniques employed by *Microeca* species and the Torrent Flyrobin. From an elevated perch offering a good view, they dart out for flying insects or to snatch items from leaf surfaces. The Canary Flyrobin uses aerial flycatching for 90% of its foraging time. Its congeners the Olive and Lemon-bellied Flyrobins, on the other hand, rely much more on sally-striking, which accounts for 50 -

**The Buff-sided Robin**  
forages mainly on or fairly close to the ground. A study in monsoon forest revealed that foraging height was from ground level to a maximum of 2 m up in 85% of recorded instances. All *Poecilodryas* robins feed mainly on insects, though other arthropods and some seeds are also taken, at least by some species. Typically, a bird will pounce down to catch an insect, and then withdraw to a safe spot, where it will manipulate the prey in its bill, manoeuvring it into a suitable position for bashing against some hard object such as the branch itself. The bird may do this to kill the insect, to soften it, or to break off tough calcified or chitinous body parts. When the item has been arranged, the robin will mandibulate it, adjusting its orientation to facilitate ingestion. The whole process takes just a few seconds.

[*Poecilodryas cerviniventris*,  
Darwin, Northern Territory,  
Australia.  
Photo: Roland Seitre]





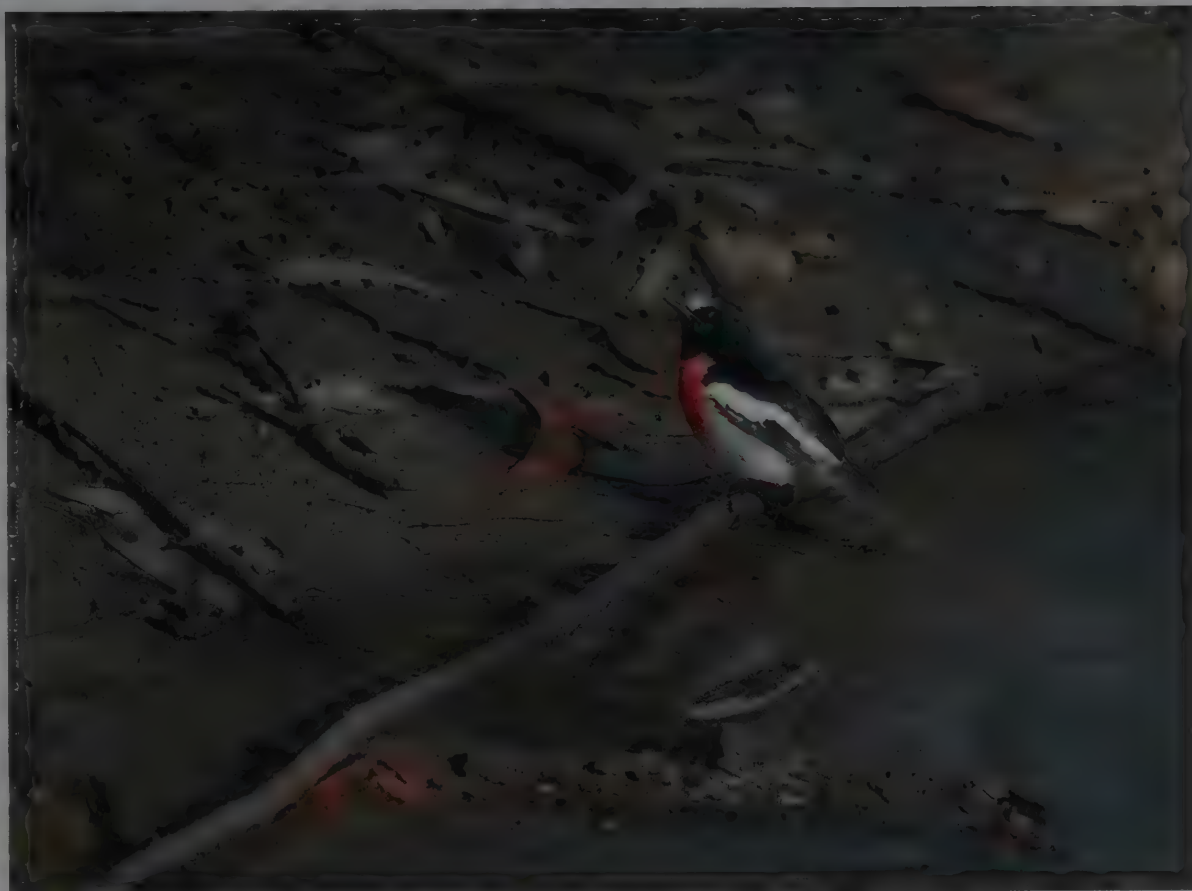


Australasian robins eat a wide variety of prey types. The bulk of the diet of most species, such as this **Flame Robin**, consists of insects and other small invertebrates. Petroicids have been recorded consuming beetles, ants, wasps, bees, stick-insects, weevils, lepidopterans and assorted larvae, as well as spiders, centipedes and earthworms, while some genera also consume small gastropods and lizards. Some robins have diversified away from animal prey, eating berries, a variety of fruit and seeds. The Flame Robin is an arthropod specialist, employing a wader-like technique to flush out insects from under leaves. It holds one leg forward and patters its foot lightly on the ground. After each bout of foot-trembling, the robin scans the ground before rushing forward to grab an insect, if successful. Seasonal shifts in foraging methods have also been documented for the Flame Robin. In winter, when flying insects disappear, this species almost always forages within 1 m of the ground. Here it spends nearly three-quarters of its time gleaning, a foraging technique it almost never deploys in summer.

[*Petroica phoenicea*,  
Mount Ginini,  
Australian Capital Territory.  
Photo: Graeme Chapman]

This resplendent male **Scarlet Robin** is drinking from a sheltered woodland pool. In common with all passerines, it cannot suck water upward. Instead, it dips its bill under the surface, traps water by closing the mandibles, then tilts its head back so that the water trickles down the throat. While doing so, it is vulnerable to predators, so it remains vigilant. The Scarlet Robin spends the majority of its life within a metre of the ground, although, interestingly, it exhibits seasonal shifts in foraging height, substrate and strategy. In winter and spring, it pounces on prey close to or on the ground, but it moves higher in summer and autumn to sally-strike for the aerial insects that are more plentiful during those seasons.

[*Petroica boodang boodang*,  
You Yangs, Victoria,  
Australia.  
Photo: Peter Fuller]



60% of foraging attempts, than on aerial flycatching, which makes up only 20–30%. The Jacky Winter, in the same genus, is unusual because it incorporates pouncing with aerial flycatching, these two methods representing, respectively, 60% and 25% of the species' foraging activity.

Hovering is a technique used, infrequently, in order to snatch insects from foliage. The only Australasian robin to employ this mode of foraging on a regular basis is the Jacky Winter. Although this species captures much of food by aerial flycatching or pouncing, it does sometimes leave its perch and hover over the ground, searching, before dropping on to prey. This habit gave the Jacky Winter the vernacular name of "Lesser Fascinating Bird". The "Fascinating Bird" was a colloquial name applied to the Restless Flycatcher (*Myiagra inquieta*), another practitioner of this hovering method of foraging. It should be pointed out that the word "fascinating", as used here, has the meaning of "hypnotizing", and it was thought that the bird's hovering action put the potential prey into a trance, making it easier to capture.

The Black-throated Robin is one of the more aerially feeding of the New Guinea petroicids. Its altitudinal range overlaps parts of those of the Slaty Robin and White-winged Robin. Because it prefers the middle and upper storeys, rather than the understorey, however, there is little competition between these species. Similarly, the Slaty Robin and the Ashy Robin occur together across much of the same elevations, but the latter species forages closer to, and often on, the ground.

It has been suggested that the wing-flicking performed by the Garnet Robin and by the Pink Robin and its relatives may serve to flush cryptic insects from leaves. A similar function has been considered for the foot-trembling behaviour of the Flame Robin. This species employs a wader-like technique in which one leg is held forward and the foot pattered rapidly on the ground. After each bout of foot-pattering, the robin scans the ground, before usually rushing forward to capture an insect.

Finally, in an extensive Australian study conducted in the high country of south-eastern New South Wales and in north-eastern Victoria, D. Robinson documented the seasonal shifts in

foraging methods by the Scarlet and Flame Robins. In the winter months, when flying insects disappear, the height from which these petroicids hunt and the relative proportions of methods used change. In the summer, the Scarlet Robin forages within a metre of the ground for about 40% of the time, with more time spent higher in the substrate; for example, 35% of foraging is done between 5 m and 16 m. The corresponding figures are markedly different in winter, when about 83% of foraging is at less than a metre and only 5% at 5–16 m. The Flame Robin exhibits a similar shift: 50% of perches are a metre or less from the ground in summer, but 97% are so in winter. Related shifts in foraging substrate and technique also occur. For the Scarlet Robin, aerial sallying and sally-striking represent, respectively, 22% and 47% of foraging attempts in summer, when they are collectively more important than is pouncing, which accounts for 30%. The Flame Robin is more reliant on sally-striking than on aerial flycatching, but together these two techniques give about the same figure as that relating to pouncing. Pouncing comprises more than 70% of the Scarlet Robin's attacks in winter, during which season aerial flycatching is reduced to only 3% and sally-striking to 25% of attacks. Gleaning, used by the Flame Robin only about 4% of the time in summer, becomes this species' major foraging technique in winter, accounting for as much as 72% of attacks. The other methods are used much less frequently: pouncing makes up 17% of attacks, aerial flycatching 10%, and sally-striking 1–5%.

The hoarding of food, or food-caching, is a well-known habit of many avian species, including a number of petroicids. The New Zealand Robin, for example, often caches food, usually among moss or in the top of logs, but it will also make use of other sites, such as stumps, holes and crevices, for this purpose. It has been suggested that social interactions are one of the primary factors influencing hoarding behaviour, such that, theoretically, subordinate individuals would cache more food than would dominant ones, in order to counter losses to the latter. In one particular study designed to test this theory, it was found that male New Zealand Robins were dominant over females but that,





In Australasian robins, the female takes sole responsibility for gathering nest material and building the nest. Most petroicids that nest in trees tend to choose a secure spot such as the fork of a limb. In contrast, the **Jacky Winter** and other *Microeca* flycatchers often build the nest on an exposed, horizontal branch. The female weaves together rootlets and grass, then binds the flat saucer-shaped structure with cobwebs. The nest is so small, and the location so precarious, that the incubating female and nestlings seem to be in constant danger of falling out.

[*Microeca fascians assimilis*, Manmanning, Western Australia, Australia.  
Photo: Graeme Chapman]

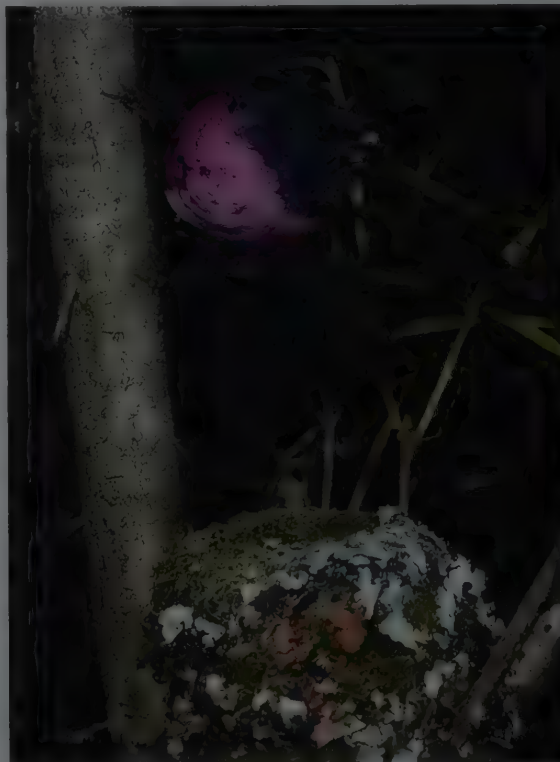
contrary to predictions, they also cached almost twice as many food items as did the females. Moreover, both sexes stored more food when they were alone than they did when accompanied by other New Zealand Robins. The researchers concluded that the relative reduction in amounts of food stored by the subordinate females and by pairs was a strategy designed to avoid the loss of cached stores to potential competitors.

## Breeding

Australasian robins breed as monogamous pairs, maintaining long-term pair-bonds. Even in the case of the migratory Flame Robin (see Movements), the two members of a pair may return to the same breeding territory each year. Helpers, or auxiliaries, have been recorded for several species, including the Eastern Yellow Robin, the Hooded Robin, the Pale-yellow Robin and the Jacky Winter, but rarely, if ever, at nests of species of *Petroica* or *Microeca*. Usually there are one or two helpers, but possibly more on some occasions.

Pairs defend their territories energetically during the breeding season, and a number of petroicids maintain a level of defence through the rest of the year, too. While breeding, the adults attack not only conspecifics, but also many other species of similar size to their own. Defence may start with scolding and chases, and expand to become physical skirmishes. Two *Petroica* species, the Flame and Scarlet Robins, in places where they occur together during the breeding season, hold mutually exclusive territories, defending these not only against conspecifics but also against each other. Once the Flame Robin has departed on its post-breeding migration, the sedentary Scarlet Robins expand their winter territories to incorporate the areas now vacated. When Flame Robins return, in spring, they are initially dominant and are able to re-establish territories within the home ranges hitherto held by Scarlet Robins. Once territories are occupied, however, the resolution of disputes is not dependent on the species' status, but on that of the individual territory-owners. Each species reacts aggressively towards playback of its own calls and that of the other, while often exhibiting little response to vocalizations of other species. Such tolerance is not shown towards the physical presence of birds that feed on the ground. The

Jacky Winter, another species that feeds by pouncing, is attacked when on the ground, while its song alone attracts little attention, whereas honeyeaters (*Meliphagidae*) and other bird species that have different foraging and feeding strategies are not often bothered. The mutual aggression between the two *Petroica* robins appears not to be related to the availability of nest-sites. Instead, it is more likely to be a response to competition for food between these similarly foraging species. This would also explain why the Jacky Winter is attacked.



In common with other *Petroica* robins and other petroicid genera such as *Tregellasia*, *Eopsaltria* and *Peneothello*, the **Pink Robin** builds a rather delicate but deep cup-nest of small fibres, twigs, vines and grasses, finely bound with cobwebs. There is often an exterior coating of lichens and the interior is lined with grass or fur. The cup is usually placed in a fork in a small tree, an average of two metres above ground. This male, complete with stunning pink underparts, is returning to the nest to feed his young.

[*Petroica rodinogaster rodinogaster*, St Helens, Tasmania, Australia.  
Photo: Graeme Chapman]

The predominantly terrestrial petroicids, such as this **Northern Scrub-robin**, are unusual within the family in that they place the nest in a saucer-shaped depression on the ground. The female usually props her nest against some suitable object, such as a log, shrub or, as here, the base of a small tree. The nest is an open, bowl-shaped structure with a diameter of over 20 cm, larger than in most robins. Its broad walls are made of thick twigs and lined with dead leaves, rootlets, tendrils and other fine plant fibres. The female lays two eggs that are pale grey and thickly blotched and spotted.

[*Drymodes superciliaris*  
superciliaris,  
Iron Range,  
Cape York Peninsula,  
Australia.  
Photo: Clifford &  
Dawn Frith]



Only a few apparent courtship displays have been reported for the Petroicidae, and these have not been described in detail. Wing-flicking is used as a part of these displays. A pre-copulatory display by a perched male Hooded Robin involves several quick bursts of two or three wing-flicks. Song flights are performed by the Lemon-bellied Flyrobin and the Jacky Winter.

One part of the bonding process is courtship-feeding of the female by the male, and this behaviour has been observed for most of the genera that have been studied. Although the male

does not contribute to the work of nest-building, he does provision his mate as she gathers material and constructs the nest. This feeding continues throughout the season. In this, as well as in territorial defence, the male is assisted by any helpers that are present.

Robins are characteristically multi-brooded, and normally rear two or three broods in a season. If a pair renests because of loss of a nest or of eggs, however, the number of clutches laid may be notably greater. Both the Tomtit and the New Zealand Robin have been recorded as making six breeding attempts in ■ single season.

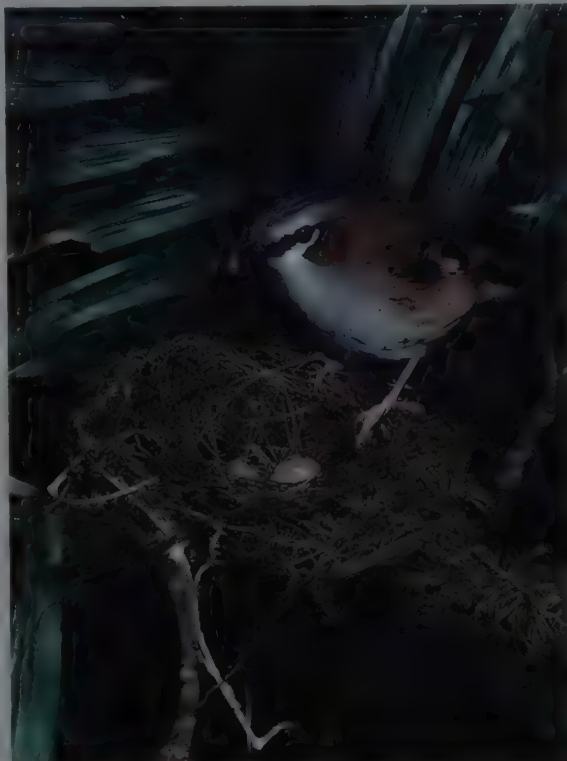
All petroicid robins for which the nests are known build an open cup-shaped structure. Within this general form, there are several subgroups that can be identified. The most distinctive nests are those of the *Microeca* species and the Torrent Flyrobin. These are small, flat saucer-shaped structures built in ■ horizontal fork of a limb or on the limb itself; they are made from grass and rootlets bound with spider webs, and are usually decorated with lichen or bark. So inadequate are they for the size of the bird that the incubating adult and, later, the growing nestlings seem to be constantly on the verge of falling out. Scrub-robins and the Lesser Ground-robin place their rather bowl-shaped nests on the ground, usually against some object, such as the base of ■ tree, shrub or fallen log. The nest and eggs of the Greater Ground-robin have not been described.

Nests of the remaining members of the family are similar to each other, but they can be further subdivided according to the material used in construction. The White-faced Robin, Eastern Yellow Robin, Slaty Robin and Rose Robin, along with other members of these respective four genera, have rather delicate cup-nests of small fibres, twigs, vines and grasses, finely bound with cobweb. The outer walls are decorated with lichen, moss or bark, often arranged to hang vertically, so that the nests are well camouflaged against the branch or trunk. In ■ further genus, *Poecilodryas*, the White-browed Robin uses coarser material, such as larger twigs and vines, for its more loosely constructed nest, which it adorns externally mainly with strips of bark and only a little moss or lichen.

Petroicid nests are typically built in the fork of a tree or shrub, but the Jacky Winter and its relatives in *Microeca* place the nest directly on a horizontal branch. The Tomtit and the Flame Robin

The eggs of the two *Heteromyias* species, exemplified by this **Grey-headed Robin**, are creamy-buff or greenish-white, blotched with brown and purplish-grey, and underlaid with deep grey patches. *Heteromyias* eggs are very similar in coloration and markings to those of the closely related *Poecilodryas* robins, as might be expected given the many other close similarities between these two genera. The eggs differ in size, however, those of *Heteromyias* being considerably larger. One or two eggs are normally laid, sometimes up to four weeks after completion of the nest. Incubation is mostly by the female.

[*Heteromyias cinereifrons*,  
Paluma,  
near south Townsville,  
N Queensland, Australia.  
Photo: Clifford &  
Dawn Frith]







**The Eastern Yellow Robin**, as with other *Eopsaltria* and also the genera *Tregellasia*, *Petroica* and *Peneothello*, constructs a delicate cup-nest made of bark strips, fine twigs, leaves and grass. The outside is bound with cobwebs, with lichen and bark chips attached. The female builds the nest, producing ■ new one for each of up to three broods in a season. She sites the nest in a fork in a shrub or tree, occasionally in vines or a tree-fern, a couple of metres above ground. Within 2–3 days of finishing the nest, the female lays two eggs, or sometimes up to four. She will incubate alone for 15–17 days, spending over three-quarters of daylight hours on the nest. After the eggs hatch, the female will brood the nestlings for ■ further 10–14 days. If the nest is approached by a predator during this period, an adult Eastern Yellow Robin—as in the case of many other petroicids—performs a distraction display a few metres away from the nest, feigning a broken wing and drawing the predator's attention away from the vulnerable nestlings. Once fledged, the young are fed by their parents until the start of the next clutch.

[*Eopsaltria australis chrysorrhos*, Mt Glorious, SE Queensland, Australia. Photo: Brian J. Coates]

The dramatic pose struck by this **Grey-headed Robin** is probably a greeting display given by the female to the male, as he approaches the nest.

The female plays the major role in the breeding cycle. She builds the nest, does most of the incubation and broods the chicks. The male's main role is to feed the female. Grey-headed Robin chicks hatch naked, with feather pins appearing at 4–5 days. Feathers emerge and eyes open four days later, and the nestling is covered in feathers at 10–11 days. Chicks leave the nest a couple of days later, but remain dependent on their parents for some 45 days.

[*Heteromyias cinereifrons*, Paluma, near south Townsville, N Queensland, Australia. Photo: Clifford & Dawn Frith]



choose a more sheltered location, preferably with some concealment above and along the sides. This may be a cavity, or a gap between a trunk and loose bark, or even on occasion near the ground between tree roots; nestboxes are also used.

Most clutches are of two or three eggs, but a figure of six eggs has been recorded for the Tomtit. The larger clutches may be the result of more than one female laying in the one nest. As with the nests, the eggs of Australasian robins fall into several subgroups. The blue or greenish-blue eggs of the *Eopsaltria* yellow robins have markings of reddish-brown, ranging from small distinct spots to larger, more diffuse blotches. This red pigmentation appears more evenly suffused through the blue background coloration on the eggs of *Melanodryas*, *Peneothello* and the Mangrove Robin. This produces a darker, rather uniform olive-green appearance. That these variations are part of a continuum is supported by the small percentage of eggs of the last-mentioned species that have discrete reddish markings on a bluish, less olive, background. In the case of the Pale-yellow, White-faced and White-browed Robins, the greenish colour often gives way to a pale buff background with darker buff blotches, producing a "washed-out" appearance. The large eggs of the two *Heteromyias* species, the Ashy and Grey-headed Robins, are variable and often very similar to those of *Tregellasia* or *Poecilodryas*, with the only difference one of size, as the coloration and markings are indistinguishable. The eggs of *Petroica* species can be generalized as being grey or white, spotted with grey or greyish-brown, although those of the Red-capped Robin have a noticeable bluish ground cover. *Microeca* stands apart from the other robins in the colour of its eggs, which have a grey or greenish background, covered with heavier, coarser brown and lavender blotches. The eggs of the Yellow-bellied Robin of New Caledonia appear more similar to these than to those of its congeners in Australia. Unfortunately, the eggs of the Torrent Flyrobin, the closest relative of *Microeca*, have not yet been described. Those of species of *Pachycephalopsis*, the scrub-robins and the ground-robins do not readily fit into these groupings. Their background

colours vary from white to light grey or pale green, and they have darker markings of several colours.

Incubation is also almost exclusively the job of the female. Occasional assistance by the male has been observed, but only the scrub-robins regularly demonstrate a more equitable division of labour, with the two parents sharing this task. The male and any helpers bring food to the sitting female. Incubation usually takes 14–20 days. The feeding of the nestlings is undertaken by both adults, assisted by any helpers that may be present. After 12–22 days, the young leave the nest, but they continue to be fed by all the others. In some instances the brood will be split between the parents, each of which accompanies and cares for part of the brood. At other times, as with the Tomtit, the female starts the next clutch before the young are independent. In such cases, the full burden of caring for the fledglings is passed to the male.

The limited information available suggests that hatchlings of the family tend to be naked initially. However, the young Lesser Ground-robin has blackish down on hatching, and by its eleventh day the chick has a speckled black-and-tan appearance, as the body feathers now covering the down are dark brown with tan tips. Unfortunately, there is no information on the breeding of its sole congener, the Greater Ground-robin. The limited data for the family indicate that several other species can take several days to grow their first feathers, the period varying somewhat from one species to another. With the Grey-headed Robin, for example, feather pins begin to appear at 4–5 days, and the feathers begin to emerge and the eyes to open four days later, most feathers having emerged at 10–11 days. In the case of White-browed Robin nestlings, down feathers emerge on days 3–6, and the eyes open on the sixth day. The two *Melanodryas* species, the Hooded and Dusky Robins, are more or less covered in bristly feathers by the age of seven days. In the genus *Petroica*, whereas Red-capped Robins hatch already with a sparse covering of down, Flame Robins grow their first down on their second day, and Tomtits on their third; the eyes open on or around the sixth or seventh days, and the remiges and rectrices emerge from the pins by about the tenth day.





This adult **Eastern Yellow Robin** is arriving at the nest to feed the incubating or brooding female. With many bird families it would be safe to assume that the arriving adult is the female's mate, but this may not always be the case with the Petroicidae. The members of *Eopsaltria*, *Tregellasia*, *Melanodryas* and *Microeca* are known to employ helpers at the nest. Whilst Eastern Yellow Robins are monogamous, in common with all petroicids that have been studied to date, a quarter of pairs have one or two helpers. These assist with territory defence and provision of food to the incubating female and young. It is not known whether or not these helpers are related to the pair—perhaps their offspring from an earlier brood—although such a scenario is known for some other co-occurring passerines such as some Australasian treecreepers (*Climacteridae*). Eastern Yellow Robins maintain their territory throughout the year, but may not always defend it during the non-breeding season. Territories tend to be used by the same pair in consecutive years.

[*Eopsaltria australis chrysorrhoea*, Mt Glorious, SE Queensland, Australia. Photos: Brian J. Coates]

While most non-terrestrial petroicids build their nests in relatively open locations, especially in the fork of a tree, or in the case of *Microeca* flyrobins on a horizontal branch, the Flame Robin (*Petroica phoenicea*) and its congener, the **Tomtit**, choose a more sheltered location. Their ideal nest-site offers concealment above and to the sides. Suitable locations include a tree cavity, as here, a gap between a tree trunk and loose bark, or, if available, a nestbox. Tomtits usually raise two or three broods per year, but may make up to six attempts if failures occur. A normal clutch size is three or four, although six eggs have been recorded. The monogamous pair is territorial all year, and both sexes defend the territory.

[*Petroica macrocephala chathamensis*, Chatham Islands, E of New Zealand. Photo: ANT/NHPA]



Helpers assist throughout the breeding process. As indicated in the preceding paragraphs, they not only feed the female as she incubates and broods, but also feed the nestlings and fledglings, and assist in the defence of the nest, performing distraction displays towards intruders. Such displays, usually in the form of feigning injury while fluttering on the ground, have been reported for all Australian and New Zealand petroicids with the exception of the *Microeca* species.

### Movements

Most of the Petroicidae do not exhibit any major seasonal movements and are generally regarded as being sedentary, although there is usually some post-breeding dispersal of young. A few species undertake some degree of altitudinal shift as the winter months approach. In ringing studies, data on retrapped individuals show little evidence of movement by the majority of the Australian and New Zealand species and those few New Guinea species for which there are sufficient records. Most information on movements derives from observations of a species' presence or absence in an area or of birds in transit. Although many individuals of several species have been ringed in Australia, fewer than a handful of recoveries have been at more than 10 km from where the individuals concerned were originally captured and ringed, and this applies even to those species known to migrate.

Two Australian members of the family are the exceptions to this general picture. Although it is known that part of the Red-capped Robin population makes seasonal movements, the nature and extent of these are not well understood. Individuals from different parts of the species' distribution vary in their responses to seasonal climatic change. In the eastern part of the range, most appear to be sedentary, as demonstrated by their presence throughout the year at many localities. Elsewhere, the species makes population shifts of different extents, including in respect of local movements, as well as exhibiting some differences in the timing and magnitude of such movements according to age-class and sex.

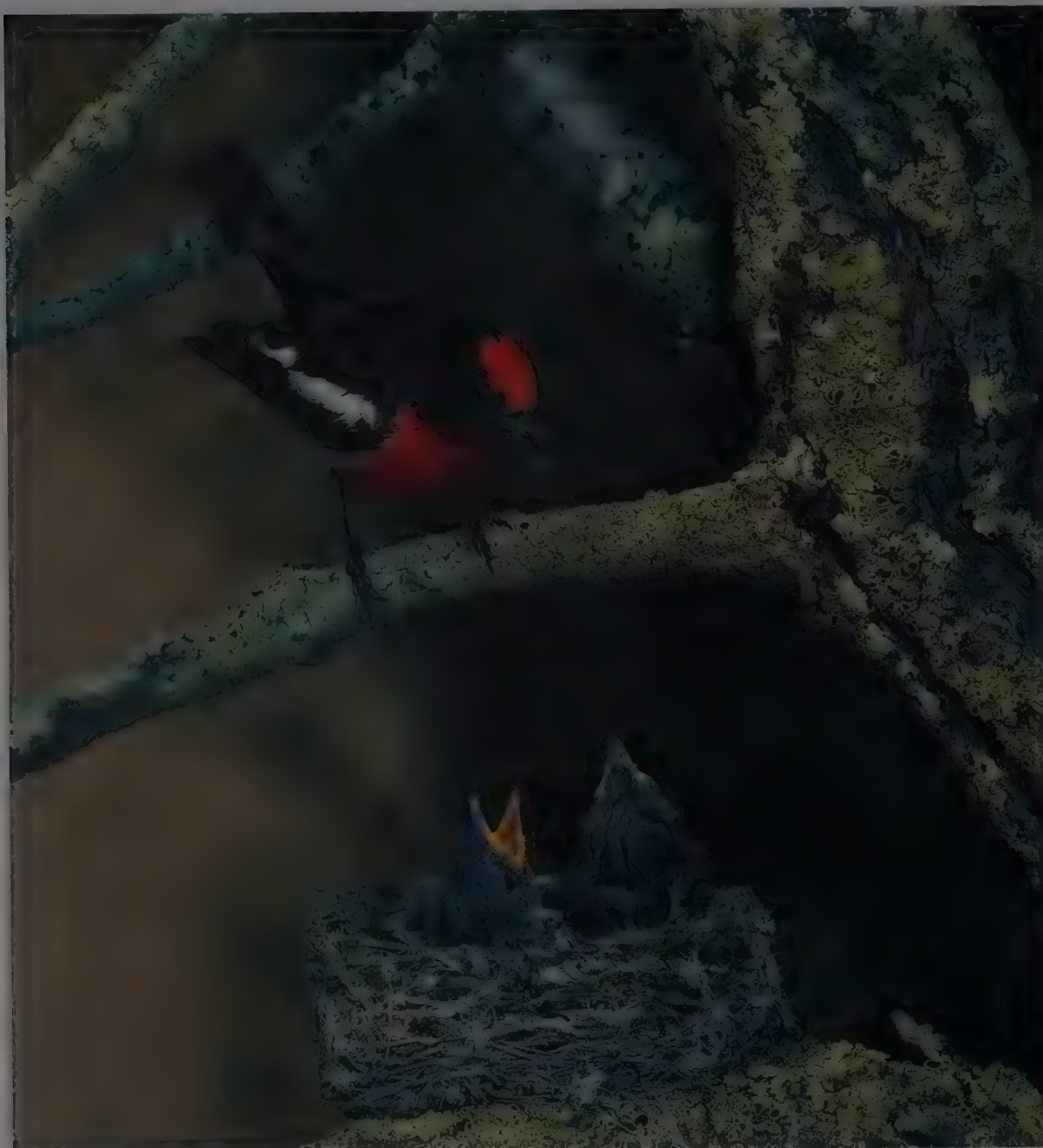
The largest-scale migration is that of the Flame Robin. This species breeds in the forested high country of south-eastern mainland Australia and Tasmania, and at the end of the austral summer, in about March, it moves out to lower elevations and more open country. Major influxes occur along the western slopes of the Great Dividing Range in Victoria, New South Wales and the Australian Capital Territory. These robins move westwards to the Riverina district of south-central New South Wales and occasionally reach the extreme south-eastern corner of South Australia. In addition, there is a noticeable northward component. Individuals move along the western slopes, as well as reaching coastal districts in the east, occasionally as far north as south-eastern Queensland. Although the migratory pattern is fairly well defined, it is somewhat confounded by individuals that remain at breeding localities throughout the winter.

Flame Robins, too, exhibit differential movements by the sexes, both on departure to the non-breeding grounds and on the return trip. There may be a difference in departure time of 5–9 days. These robins migrate together in small bands. These can contain up to 30 individuals, with one record of 200 birds, but 12–15 is the usual flock size. Some individuals return to the same non-breeding site for several successive years. Departure dates on the return journey are scattered across a two-month period, but by August Flame Robins are back on their highland breeding grounds and establishing territories there.

The mainland migration of the Flame Robin is well known, but there remain questions about those that breed in Tasmania. It has been claimed for some time that the latter can cross the Bass Strait to the south-eastern mainland, but evidence for this passage is as yet scant.

For both the Flame and the Red-capped Robins, the extent of the movements are not reflected in the ringing data. No retraps of Red-capped Robins have been made more than 10 km from the initial ringing site. There is slightly more information in this regard for the Flame Robin. Of all marked individuals of this species that have been retrapped, almost 99% have been at the site where they were originally ringed. A mere 0.03% have been





This exquisite creature is the male **Red-capped Robin**, a spectacular inhabitant of the southern two-thirds of mainland Australia. He appears to have just fed his two chicks, probably with a terrestrial insect or other small arthropod. Red-capped Robins breed as a monogamous pair, and will rear up to four broods in a season, from up to ten attempts. If sedentary, the pair will defend their territory all year round. Where the pair migrate, the male will occupy a territory soon after returning to the breeding grounds. As with most Australasian robins, the female plays the major role in the breeding cycle. She builds the nest, incubates the eggs for 12–16 days, and broods the chicks for a similar period. Fledglings remain in their parents' territory for up to six weeks. Proximity to their parents helps the fledglings avoid avian predators such as the Grey Shrike-thrush (*Colluricincla harmonica*).

[*Petroica goodenovii*.  
Photo: Hans & Judy Beste/  
Ardea]

caught 10–49 km from this site, and a further 0.03% more than 100 km away. The longest recorded movement to date was made by a Flame Robin that was recovered 351 km from where it had first been ringed.

Altitudinal shifts are undertaken also by the Hooded Robin, the Scarlet Robin and the Tomtit, which leave higher-lying country for more open, lower elevations. It has been suggested that this apparent movement may be overemphasized, because more birds are visible owing to local shifts to open habitats, rather than influxes from other regions.

Only four petroicid species occur outside the three major regions of Australia and Tasmania, New Guinea and New Zealand. The Tanimbar Flyrobin and the Yellow-bellied Robin occupy only single island groups, while the Torrent Flyrobin has made the journey from New Guinea to New Britain. The Pacific Robin is the only member of the family having an extensive distribution outside this core area, being found on islands as far east as Samoa. Presumably, the Scarlet Robin of mainland Australia gave rise to these insular populations, but, interestingly, that species shows little evidence of substantial population excursions in its present range.

### *Relationship with Man*

Australasian robins were well known to early colonists of that region, an acquaintance that continued until extensive urbanization eliminated these birds from many areas of human occupation. The confiding nature of robins, and their willingness to approach humans to exploit any prey disturbed, soon brought them to the attention of European settlers. Some of the first names given to the members of the family, such as "robin" or "Tomtit", were based on the birds' resemblances to British species. Later, these birds gained their own names. The familiarity of petroicids to humans is reflected in the range of colloquial names given to them, examples being "Yellow Bob" for the Eastern Yellow Robin, "Dozey Robin" or "Stump Robin" for the Dusky Robin, "Post-sitter" or "Stump Bird" for the Jacky Winter, and "Robin Redbreast" for the Scarlet Robin. Several of the species, particularly the Dusky Robin and the New Zealand Robin, are noted for the habit of attending a person digging in the soil, where the bird captures any food items uncovered. At times, writers have expressed concern about the safety of these birds, as they got so



This male **Scarlet Robin** has brought its chick a moth. Nestlings need regular feeding to enable them to grow quickly so that they can soon leave the nest, where they are particularly vulnerable.

While around half of Scarlet Robin eggs hatch successfully, as few as 8% of nestlings make it to the fledging stage. A lone chick may have an advantage in that it does not need to share the food its parents bring, but it still has to avoid predation by snakes for the 16–18 days or so until it leaves the nest. The Scarlet Robin and congeners breed monogamously, without the helpers employed by other genera. This pair have already avoided one key pitfall of parenthood: brood parasiticism. Many species of Australasian robin are parasitized by cuckoos, such as the Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Brush Cuckoo (*C. variolosus*), and Shining Bronze-cuckoo (*Chrysococcyx lucidus*).

[*Petroica*

*boodang campbelli*,  
SW Western Australia,  
Australia.

Photo: Michael Morcombe/  
NHPA]





One of the important tasks for the parents during the nestling phase is to keep the nest clean and as free as possible from the twin threats of disease and parasites. This entails the removal of the young birds' droppings in the form of faecal sacs, as demonstrated here by **White-breasted Robins**. The droppings are taken away in the adult's bill and deposited at some distance from the nest. Thus, in addition to the sanitary aspect, the adults strive to remove the possible tell-tale signs of the droppings, which could easily attract the attention of potential predators.

[*Eopsaltria georgiana*, Denmark, SW Western Australia, Australia.  
Photo: Bill Belson/Lochman Transparencies]

close underfoot that injury from a shovel seemed almost unavoidable. The species mentioned are birds of the temperate forest and woodlands, places selected by human colonists for building their homes, whereas those inhabiting rainforest did not attract this association. Most of the latter species lack comparable colloquial names.

Before Europeans applied colloquial names to the Petroicidae, the indigenous peoples of these lands did, of course, already have their own names for these birds. Among the Aboriginal Australian names are *mangarawan*, for the Jacky Winter, *gimbanibobob*, for the Scarlet Robin, *gooba-mogin*, for the Hooded Robin, and *djulim djulim*, for the Eastern Yellow Robin, while the Maori people refer to the New Zealand Robin as *toutoutwai* and the Tomtit as *miromiro*.

Not far east of New Zealand, in the Chatham Islands, the Black Robin has had a notable influence on the human population in recent years. In the final quarter of the twentieth century, this petroicid came very close to global extinction, and was rescued at the last minute by conservation action (see Status and Conservation). A single female Black Robin, the only egg-laying one remaining, was responsible for the species' survival, and this female was duly honoured with a memorial plaque, a commemorative dollar coin and a postage stamp.

Most of the robins of New Guinea are denizens of the rainforest, but here they are well known to the local inhabitants. Their tameness is recognized, but not always to the benefit of the bird. Among the Kalam people from the Kaironk Valley, in the Schrader Mountains, the White-winged Robin is noted for its apparent fearlessness. The Kalam name for the Pied Bushchat (*Saxicola caprata*) is *wlmen*, and the White-winged Robin is called *wlmen saky*, the word *saky* meaning "foolish" or "mad"; the robin earns its name because it looks like the bushchat but acts in a silly way, not flying away if a hunter stalks it. Similarly, the Garnet Robin is noted as being not shy and is therefore easy to shoot. This species is known for its incessant movement, leading to its Kalam name of *jeptpi*, meaning "shyer", "quiver" or "titter". In the native language of the people of the Finisterre Range, this same habit gives the species the name *lekdasat*, referring to its flashing wings.

The Slaty Robin is considered by the Kalam to be a witch-bird. It gains its reputation from its elusiveness as it moves about,

calling from one place and then another, without being seen. Local people are consequently frightened of it. In contrast, the Black-throated Robin, known in the Kalam language as *wet*, instils no such fear. Because of its stocky, big-bellied appearance, its name is sometimes applied to pot-bellied young boys.

Finally, the Torrent Flyrobin holds a special place in the social interactions of humans in the Finisterre Range of north-east New Guinea. There, the inhabitants have a *puak* dance cycle, a series of dances that helps to establish and reinforce their unity. The cycle includes and binds adjacent villages, taking about a year to complete. As the dance moves from one village to the next, on a monthly basis, boys from one village also move to another. An important component of this ceremony is the song of *booman*, the Torrent Flyrobin, performed by all participants at



After leaving the nest, young **Pale-yellow Robins** require considerable input from their parents, or adult helpers. Once fledged, the young hide in dense vegetation for several days to escape the attention of predators. During this time each members of the co-operatively breeding group takes its turn in feeding the fledglings. Each fledgling then follows a different parent which feeds it for a further seven or eight weeks. The young only become fully independent when they are ten weeks old.

[*Tregellasia capito capito*, Mt Glorious, SE Queensland, Australia.  
Photo: Brian J. Coates]

the closing of each village stage. This song is used also for communication between villages across a torrent, as a call to meet.

### Status and Conservation

Many bird species in Australia and New Zealand have reacted badly to human modification of their habitats. The Hooded Robin in south-east Australia and the Scarlet Robin in the south-west are regarded as locally near-threatened because of their sensitivity to habitat loss and fragmentation. These birds appear to be poor at recolonizing fragments from which they have been lost. Indeed, the population of Hooded Robins on the Tiwi Islands, off the Northern Territory coast, is potentially threatened by extensive clearing of native habitat for farming of the acacia species *Acacia mangium*, and is considered vulnerable there. Likewise, the nominate race of the Pacific Robin, confined to Norfolk Island, underwent a marked population decline during the 1980s in response to habitat modification and the introduction of the black rat (*Rattus rattus*). Its numbers have now stabilized at 400–500 pairs, which are more or less restricted to forested areas, including land protected within a national park.

One of the very few examples of a bird taxon believed to have become extinct in mainland Australia since the arrival of Europeans was the described subspecies *colcloughi* of the Northern Scrub-robin. This is known from only two specimens collected in 1910 by M. J. Colclough, supposedly from the Roper Torrent, in Northern Territory. The absence of subsequent records led to concern over the status of this population. An extended search through the area in 1980 found no evidence of the scrub-robin, and led to the conclusion that changes in burning practices had resulted in the destruction of its critical monsoonal thickets. A later re-examination of the specimens, as part of a revision of Australian populations, judged that the Roper Torrent locality was, in fact, in error. Colclough had, on the same trip, collected zoological specimens on Cape York Peninsula, and his list of purported Roper Torrent birds includes some other northern Queensland species. It is now believed that the description of *colcloughi* was based on incorrectly labelled specimens, and this taxon has therefore been removed from the Australian list.

The New Zealand species have been hit particularly hard by mammalian predators, mainly mustelids, both native and introduced rodents, and the introduced common brushtail possum (*Trichosurus vulpecula*). The low breeding success of the New Zealand Robin is reflected by the reported nest-predation rates in several studies of 55–69%. Elsewhere, predation rates on eggs



and nestlings of, respectively, 23% and 46% have been recorded. Predator-control programmes in which poison has been used have had exceptional benefits. At Kowhai Bush, on the South Island, a pre-control success rate over two seasons of 22.9%, equivalent to 1.1 offspring reared per pair per season, was raised to 68.7%, or 3.8 offspring per pair per season, after poisoning. At other sites, success in the absence of predators has reached 89%, and at one location an average of 5.9 offspring per pair was achieved, with a maximum of eight young produced by one pair in a single season. Translocation of New Zealand Robins to predator-free islands has also proved successful, with hatching rates of up to 85%. A drawback of these control programmes is that the robins sometimes eat the baits, or feed on invertebrates that have done so, and are themselves poisoned. Nonetheless, the marked improvement in breeding success in places where baits are used is deemed to justify these efforts.

One of the most remarkable stories in avian conservation is that of the Black Robin. At one stage, with the total population reduced to five individuals, this was the rarest bird in the world. Before the arrival of Europeans, this species lived throughout the Chatham Islands, situated east of New Zealand. Human activity, however, caused its extirpation everywhere except on Little Mangere, a small island no more than 1 km<sup>2</sup> in size. Here, the robin was safe from predators, protected by the 200-m cliffs, but this location, nevertheless, offered rather treacherous conditions because of extensive wind damage, which caused erosion, with the loss of food and habitat.

When the New Zealand wildlife department carried out a survey of the Chathams in 1972, it could find only 18 individuals of the Black Robin. It was decided to translocate the robins to another, more suitable island. A wildlife society named "Forest and Bird" helped to purchase the larger, neighbouring Mangere Island, and new habitat was created through a programme of planting, with a total of 120,000 new trees. In 1976, all the Black Robins were captured and moved to Mangere Island, but by now their number had dropped to a mere seven individuals. The move did not produce an initial positive outcome: the robins made several breeding attempts, but these were unsuccessful, in addition to which two individuals died, leaving the population further reduced to a total of only five, consisting of three males and two females. A subsequent decision was made to undertake active

Endemic to New Guinea, the **Alpine Robin** qualifies as a restricted-range species, occurring only in the Central Papuan Mountains Endemic Bird Area. It forages for insects in the canopy of montane forest, in subalpine shrubland, and around the ecotone between subalpine forest and alpine grassland above 2750 m. The population size of this poorly known species has not been quantified, but is thought to be sizeable, particularly as the species is common in at least parts of its range. Given this, and the varied habitat occupied, the species seems to be secure and is not listed as globally threatened.

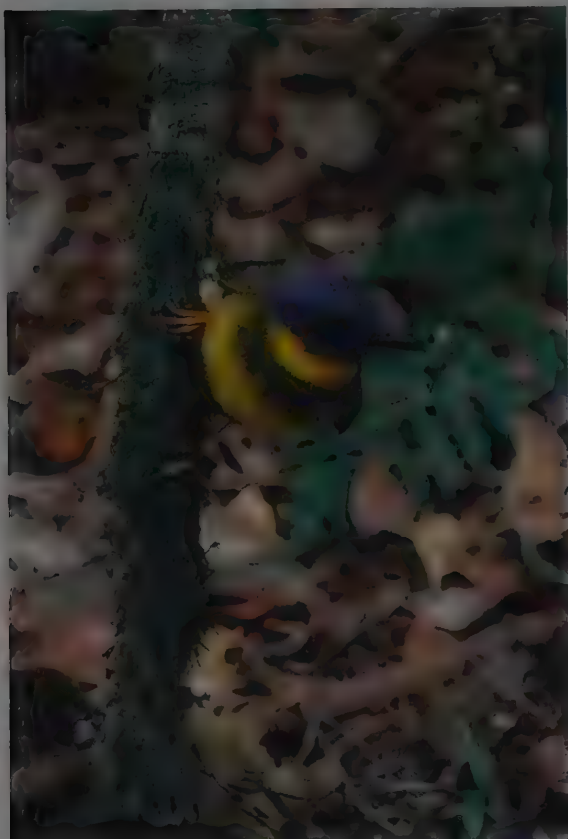
(*Petroica bivittata caudata*,  
West Papua,  
W New Guinea.  
Photo: Morten Strange)

The only member of Petroicidae to occur in New Caledonia, the **Yellow-bellied Robin** is a restricted-range species. It inhabits dry lowland forest, pine-pandanus (*Pinus-Pandanus*) forest and humid forest from sea-level up to 1525 m. It forages for its insect prey principally among leaf litter. It is considered quite common, in parts of its range at least, and does not appear to be immediately threatened.

(*Eopsaltria flaviventris*,  
Rivière Bleue Reserve,  
S New Caledonia.  
Photo: Roland Seitre)







intervention in order to save the species. The plan was originated and overseen by D. V. Merton, of the Wildlife Service. Starting in the 1980–81 breeding season, wildlife officers removed the eggs of a nesting Black Robin and placed them in the nest of a Chatham Gerygone (*Gerygone albofrontata*) for incubation. The parent robins would quickly lay a new clutch of eggs to replace that taken for cross-fostering. Unfortunately, the gerygones proved not to be suitable parents; once the eggs hatched, the young Black Robins needed to feed at a faster rate than that at which they were provisioned.

A different foster-parent was tested. In the following season, the Tomtits on Rangatira Island, known also as South-east Island, were employed in this role. These were quickly successful in hatching and rearing the young Black Robins, but there was another complication. The young robins imprinted on the Tomtits, learning their songs, and moreover, once mature, they would not mate with members of their own species. A further modification to the plan was introduced. After the young robins had hatched, but before they had fledged, they were removed from the Tomtits' nests and returned to those of the Black Robins. Through this approach, the risk of incorrect imprinting was avoided. The fostering having proven successful, it was decided, in 1983, to establish a new population on Rangatira Island, to which two pairs of Black Robins were accordingly moved. This island, with a surface area of 2 km<sup>2</sup>, is larger than Mangere Island and it has a greater forest cover.

The intricacies of cross-fostering were not the only problem facing the conservationists. When this programme began, only two of the five robins were female, and only one of these two laid fertile eggs. Because of the coloured ring on her leg, this female received the name of "Old Blue". She paired with a male the leg-ring colour of which earned him the name of "Old Yellow". Old Blue proved to be a remarkable bird. She did not even start to breed until the advanced age of nine years. During the next four years, she laid more eggs than did any other individual subsequently involved in the recovery programme, and she produced a total of eleven chicks. All Black Robins alive today are directly related to her. In 1983, when Old Blue was no longer breeding successfully, she was moved to Rangatira Island, al-

lowing Old Yellow to find a new mate. Old Blue died at the age of 13. The sad news of her passing was announced in the New Zealand Parliament, and she was honoured posthumously in a variety of ways (see Relationship with Man).

Black Robins now have two thriving populations, with a world total of about 250 individuals. Mangere Island and Rangatira Island are, however, reaching their carrying capacity. Plans are underway to establish another population, on Pitt Island, but this will require that predators are first removed from some or all of the island. There is the potential also for genetic problems with the surviving birds, since they originate from such a small founder population; thus far, no such problems have manifested themselves. The success of the Black Robin recovery programme has made it a benchmark in avian conservation. Nevertheless, the species is still "officially" listed as Endangered, a sensible precaution when one considers that its global range and population are both extremely small.

BirdLife International does not list any other members of the family as globally threatened, but it assesses the Tanimbar Flyrobin and the Olive-yellow Robin as Near-threatened and the Snow Mountain Robin as Data-deficient. The Tanimbar Flyrobin has a restricted distribution, parts of which are experiencing extensive logging. This species remains common within the Indonesian archipelago after which it is named, but what its response to large-scale habitat modification will be is uncertain. Logging is occurring also at some of the sites where the Olive-yellow Robin has been recorded. The very patchy distribution of this species makes it difficult to obtain any reasonable estimate of its current population level. Because some of its scattered localities are in areas that are difficult of access, however, this petroicid is likely to be safe from extensive forest alteration. The status of the Snow Mountain Robin presents similar problems of assessment, but in its case because much of its high-altitude habitat is infrequently visited. Some mining takes place near part of its range.

Finally, it has recently been suggested that the Flame Robin merits inclusion within the conservation category of Near-threatened. This species, which lives in south-east Australia and Tasmania, is still common and numerous, with a population thought likely to exceed 1,000,000 individuals, but it seems to have declined greatly over the last 25 years. As much of its breeding range is in uncleared upland forests, and because its non-breeding areas lie mainly in agricultural lands, the most likely reason for its decline is believed to be a rise in ambient temperature. It is of relevance that recent increases in temperature have been greater in south-east Australia than anywhere else on the continental mainland.



Another New Guinea endemic, the **Olive-yellow Robin** is patchily distributed in hill forests across the island, occurring up to altitudes of about 1450 m. A restricted-range species, its distribution spans three of the Papuan Endemic Bird Areas. Although the small total population may be isolated into subpopulations, some of which may be threatened by logging, its largely inaccessible range suggests that relatively secure subpopulations remain to be discovered. Nevertheless, the Banded Robin's reliance on a disappearing habitat and patchy distribution have led to it being classified as Near-threatened.

[*Poecilodryas placens*, Vaimauri River, SE New Guinea. Photo: William S. Peckover]

The **Tanimbar Flyrobin** inhabits the middle storey of forest, forest edge, mangroves and open woodland in the lowlands of the Tanimbar islands of Larat and Yamdena, at the eastern end of the Indonesian archipelago. It is a restricted-range species, endemic to the Banda Sea Islands Endemic Bird Area. Although the species is common, substantial logging occurs in parts of its range, and it is likely to be susceptible to habitat loss and degradation. Accordingly, it is listed as Near-threatened.

[*Microeca hemixantha*, Yamdena, Tanimbar Islands, Indonesia. Photo: Mehd Halaouate]

With a population in excess of one million individuals, the **Flame Robin** of south-east Australia and Tasmania may seem an unlikely addition to the list of birds classified as Near-threatened. This status is allocated on the basis of a marked decline in reporting rate over the last 25 years, coupled with contraction from the periphery of its winter range. A good deal of this species' breeding range lies in intact upland forests and most of its wintering range in agricultural areas, and it is suspected that the decline may be due to recent temperature increases, which have been greater in south-east Australia than anywhere else on the mainland.

[*Petroica phoenicea*,  
You Yangs, Victoria,  
Australia.

Photo: Peter Fuller]



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Occurring only in the Chatham Islands Endemic Bird Area near New Zealand, and thus a restricted-range species, the **Black Robin** was once the world's rarest bird, but it has now become one of conservation's great success stories. By 1980, just five individuals were left, but intensive management has resulted in a continuous increase in numbers to 250 birds.

Although it is out of immediate danger, the islands it inhabits are reaching carrying capacity, so the species is still treated as Endangered, as a precautionary measure.

[*Petroica traversi*,  
Rangatira,  
Chatham Islands,  
E of New Zealand.

Photo: Brian Chudleigh]







## Subfamily DRYMODINAE

### Genus *AMALOCICHLA* De Vis, 1892

#### 1. Lesser Ground-robin

##### *Amalocichla incerta*

**French:** Petite Pseudobréve **German:** Kleine Pittadrossel **Spanish:** Petroica Terrestre Chica  
**Other common names:** Lesser New Guinea Thrush, Rusty Velvet-thrush, Dubious False-thrush

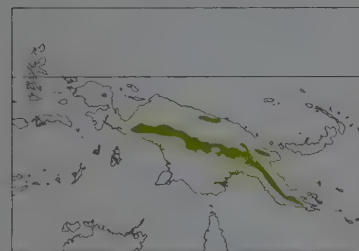
**Taxonomy.** *Eupetes incertus* Salvadori, 1876, Mount Arfak, New Guinea. Relationships of genus uncertain; formerly placed with thrushes (Turdidae), and possibly does not belong with present family. Birds from Huon Peninsula usually assigned to race *brevicauda*, but may be closer to *olivascens*. Three subspecies recognized.

##### **Subspecies and Distribution.**

*A. i. incerta* (Salvadori, 1876) – Arfak Mts, in NW New Guinea.

*A. i. olivascens* E. J. O. Hartert, 1930 – C North Coastal Range (Torricelli Mts) and mountains of C New Guinea E to Mt Karimui and perhaps to Aseki area of Morobe Province.

*A. i. brevicauda* (De Vis, 1894) – mountains of Huon Peninsula and SE New Guinea.



**Descriptive notes.** 14–15 cm; 30–31 g. Nominate race has crown and upperparts deep brown to rufous-brown, whitish spot on side of forehead, brown side of head; wing dusky brown, remiges with outer webs edged rufous-brown, rufous spot near base of inner web (except for outer four primaries); tail dusky brown, rectrices with outer webs tinged brownish-rufous; chin, throat and side of neck whitish, breast and flanks medium rusty brown, belly white, undertail-coverts pale rufous; underwing with pale stripe across bases of remiges; iris brown; bill black; legs grey or grey-brown. Sexes similar. Juvenile differs from adult in

having buffy-brown spotting on crown and side of head, rich rufous spotting on back and upperwing-coverts, and dark brown mottling on underparts, most heavily on breast; whitish loreal spot initially absent. Race *olivascens* has upperparts deeper brown with reduced rufous wash, white throat feathers tipped black, breast and flanks more greyish-brown; *brevicauda* has white on belly reduced. Voice. Song described as a light breezy whistle of several notes; single individual produces two different songs of 8 notes, first one largely descending and the second at about same pitch for most of duration, alternating these songs as it moves such that they are not given at same place (previously thought to involve duetting by two individuals). Call a short, high nasal buzz followed by harsh “ch-ch-ch-ch” chatter.

**Habitat.** Montane forest, mainly at 1200–2750 m; down to 900 m in *Araucaria* forest.

**Food and Feeding.** Insects. Feeds on forest floor, making short runs interspersed with brief stops to glean; foraging pattern likened to that of a plover (Charadriidae).

**Breeding.** Nest with single egg in mid-Oct and nest with hatching egg in early Jan; juvenile in Dec. Nest an open cup composed primarily of moss, with blades of grass and fine rootlets, lined with dry grasses, internal measurements 4 cm across and 3 cm deep, placed on ground close to moss-covered tree root and surrounded by fallen leaves, sticks, etc.; once 1.2 m above ground on bed of moss 5 cm deep in tree hole 30 cm deep, with opening on each side, tree diameter 20 cm. Clutch 1 egg, whitish, with a few small brownish-black spots mostly at larger end, or with fine chocolate-brown spotting all over, size 28 × 19.5 mm; no information on incubation and nestling periods.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Generally uncommon to rare and local, although has been found to be locally common.

**Bibliography.** Bailey (1990), Beeher *et al.* (1986), Coates (1990), Diamond (1972), Finch (1981c), Gyldestolpe (1955a), Hartert (1930), Iredale (1956), Lamothe (1980), Pruett-Jones & Pruett-Jones (1982), Rand (1942a), Rand & Gilliard (1967), Rothschild & Hartert (1903b), Salvadori (1881).

#### 2. Greater Ground-robin

##### *Amalocichla sclateriana*

**French:** Grande Pseudobréve **Spanish:** Petroica Terrestre Grande  
**German:** Große Pittadrossel

**Other common names:** Greater New Guinea Thrush, Cloudforest Velvet-thrush, Sclater's False-thrush

**Taxonomy.** *Amalocichla sclateriana* De Vis, 1892, Mount Owen Stanley, New Guinea.

Relationships of genus uncertain; formerly placed with thrushes (Turdidae), and possibly does not belong with present family. Two subspecies recognized.

##### **Subspecies and Distribution.**

*A. s. occidentalis* Rand, 1940 – Oranje Mts, in C New Guinea.

*A. s. sclateriana* De Vis, 1892 – mountains of SE New Guinea (Mt Albert Edward, English Peaks, Mt Scratchley, Mt Kenevi, Mt Suckling).

**Descriptive notes.** 20 cm. Nominate race has crown and upperparts dark olive-brown, side of head warm brown; loreal area light grey, eyering pale buff; wing dark brown, remiges and wing-coverts edged with rufous, more broadly so on secondaries; tail dark olive-brown; chin and upper throat pale grey, finely mottled with brown, lower throat to neck side off-white; breast mottled grey-brown, side of belly and flanks grey, centre of belly off-white to pale buff; underwing with pale stripe across bases of remiges; iris dark brown; bill dusky brown, paler on lower mandible; legs straw-brown. Sexes similar. Juvenile has head and back pale rufous, mottled with black, wing-



coverts barred rufous and black, breast feathers reddish-brown and narrowly tipped black. Race *occidentalis* has upperparts darker and more rufous than nominate, underparts more rufous olive-brown, and bill longer. Voice. Little precise information available, but includes loud 3-note whistle, and sharp, scolding alarm call; other whistled calls.

**Habitat.** High mountain forest, at c 2800–3720 m.

**Food and Feeding.** Insects, including beetles (Coleoptera), also spiders (Araneae). Terrestrial; forages on forest floor.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Central Papuan Mountains EBA. Locally fairly common, but elsewhere scarce or rare. Quite cryptic in behaviour, and therefore little known.

**Bibliography.** Beeher (1993), Coates (1990), Iredale (1956), Mayr & Rand (1937), Rand (1940b).

### Genus *DRYMODES* Gould, 1841

#### 3. Northern Scrub-robin

##### *Drymodes supercilii*

**French:** Drymode bridé **Spanish:** Petroica Matorralera Norteña  
**German:** Augenstreif-Scheindrossel

**Other common names:** Eastern/Papuan/New Guinea Scrub-robin

**Taxonomy.** *Drymodes supercilii* Gould, 1850, Cape York, Queensland, Australia.

Genus conventionally placed in thrush family (Turdidae) on basis of largely terrestrial lifestyle, upright posture and associated morphology, but subsequently shown to have different syringeal structure; studies of DNA–DNA hybridization indicate that it belongs with present family. Formerly accepted race *colcloughi*, known from only two specimens collected in 1910, supposedly from R Roper, in Northern Territory (Australia), now thought to have been based on specimens of mistaken provenance. Four subspecies recognized.

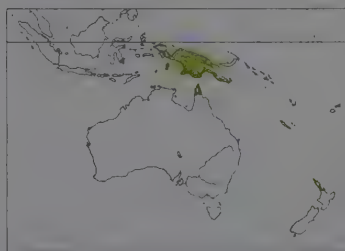
##### **Subspecies and Distribution.**

*D. s. beccarii* (Salvadori, 1876) – W New Guinea (Arfak Mts, Wandammen Mts).

*D. s. nigriceps* Rand, 1940 – N New Guinea E to Telefomin area, C North Coastal Range (Torricelli Mts) and Adelbert Mts.

*D. s. brevirostris* (De Vis, 1897) – S & SE New Guinea and Aru Is.

*D. s. supercilii* Gould, 1850 – N Australia (N Cape York Peninsula, in N Queensland).



**Descriptive notes.** 21–22 cm; 42–46 g. Nominate race has lores and spot behind eye white, vertical black stripe from above front of eye to side of lower throat, buff ear-coverts grading into hindneck; forehead and upperparts to lower back cinnamon-brown, rump and uppertail-coverts bright rufous; upperwing blackish-brown, greater and median wing-coverts broadly edged white (forming two white bars on folded wing), outer primaries edged white distally (forming whitish patch), alula edged white, tertials broadly edged buff; tail bright rufous-brown, outer four feather pairs broadly tipped white, amount of white increasing outwards; chin and throat white, underparts light buff, side of belly and flanks washed rufous; iris dark brown; bill black; legs pink. Sexes similar. Juvenile is poorly known, reportedly duller and more rufous, with spotting on upperparts, rufous edges of wing-coverts; immature similar to adult, but retaining juvenile wing-coverts. Race *brevirostris* has upperparts tinged cinnamon; *nigriceps* has upperparts much darker and duller brown, male with brownish-black crown; *beccarii* is like previous, but upperparts slightly paler, crown slightly darker. Voice. In New Guinea c. 5 high-pitched drawn-out descending whistles; in Australia several thin, drawn-out whistles. Also harsh scolding notes.

**Habitat.** Rainforest, monsoon forest, and vine thickets; often in fairly open understorey with dense layer of litter but limited undergrowth, also at forest edge; less frequently in dense undergrowth. In Australia found in lowland areas; in New Guinea, in lowlands into hills up to c. 1450 m.

**Food and Feeding.** Invertebrates, including insects and small gastropods. Forages on ground, generally in dense cover, using bill to turn over fallen leaves and debris.

**Breeding.** Following details based on Australian data; no information from New Guinea. Season Nov to late Jan. Nest, built by female, an open bowl-shaped structure with thick walls, of sticks and twigs, lined with dead leaves, rootlets, tendrils and other fine plant fibres, external diameter 22.9 cm, height 7.6–11.4 cm, internal diameter 7.6 cm, depth 8.9 cm; placed in saucer-shaped depression in ground, usually at base of tree, shrub or fallen log. Clutch 2 eggs, pale grey, thickly spotted and blotched with blue-grey and red-brown, 22–25.4 × 17.8 mm; incubation by female or by both sexes; no information on duration of incubation and nestling periods. Greatest recorded longevity 5 years 11 months.

**Movements.** Sedentary. Few recoveries of ringed individuals, all less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Locally not uncommon, but generally scarce and difficult to find; locally common in Australia in Cape York Peninsula. Occurs in Varirata National Park, in New Guinea.

On following pages: 4. Southern Scrub-robin (*Drymodes brunneopygia*); 5. Ashy Robin (*Heteromyias albispecularis*); 6. Grey-headed Robin (*Heteromyias cinereifrons*); 7. White-browed Robin (*Poecilodryas superciliosa*); 8. Buff-sided Robin (*Poecilodryas cerviniventris*); 9. Black-sided Robin (*Poecilodryas hypoleuca*); 10. Black-chinned Robin (*Poecilodryas brachyura*); 11. Black-throated Robin (*Poecilodryas albonotata*); 12. Olive-yellow Robin (*Poecilodryas placens*).



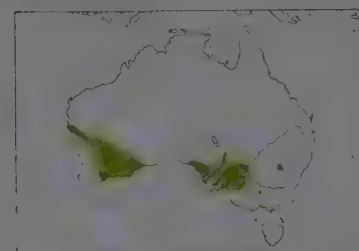
**Bibliography.** Barrett *et al.* (2003), Bennett (1983), Boles (1988), Coates (1990), Diamond (1972), Finch (1982b), Frith & Frith (1993a), Higgins & Peter (2002), Iredale (1956), Macgillivray (1914, 1918), Mathews (1921), Mayr & Rand (1937), Officer (1964), Parker (1970a), Rand & Gilliard (1967), Salvadori (1881), Schodde & Mason (1999), Sibley & Ahlquist (1982a).

## 4. Southern Scrub-robin

### *Drymodes brunneopygia*

**French:** Drymode à croupion brun **Spanish:** Petroica Matorralera Sureña  
**German:** Malleescheindrossel  
**Other common names:** Mallee/Pale Scrub-robin

**Taxonomy.** *Drymodes brunneopygia* Gould, 1841, belts of the Murray, South Australia, Australia. Genus conventionally placed in thrush family (Turdidae) on basis of largely terrestrial lifestyle, upright posture and associated morphology, but subsequently shown to have different synapical structure; studies of DNA-DNA hybridization indicate that it belongs with present family. Monotypic.  
**Distribution.** S Australia: scattered locations in SW Western Australia (except for extreme SW corner), SE South Australia (E from Eyre Peninsula, S from Flinders Ranges), C & SW New South Wales and N & NW Victoria.



**Descriptive notes.** 18.5–22 cm; male 36–38 g, female 30 g. Side of face and neck are brown, with faint pale supercilium, white lores and eyering, short vertical black mark through eye; crown and nape to back dark grey-brown, rump dark brown, uppertail-coverts rufous-brown; upperwing grey-brown, median and greater wing-coverts with pale tips (forming double wingbar); tail dark rusty, all except central pair of rectrices tipped white; chin white, grading into brownish-grey throat and underparts, belly paler, vent brown; iris dark brown; bill and legs black. Sexes alike. Juvenile is grey-brown with pale streaks and darker mottling, streaked

wing-coverts; immature similar to adult, but retains streaked juvenile wing-coverts. **Voice.** Song a musical "chip chip par-ee". Probable contact call a shrill high-pitched "pee-pee"; alarm a rattling chatter, "charr-rrr-tuk-ertuk-ertuk".

**Habitat.** Dense mallee and other semi-arid scrub, particularly favouring broombush; also heath, coastal tea-tree (*Leptospermum*) thickets, and eucalypt (*Eucalyptus*) woodland with dense understorey.

**Food and Feeding.** Insects and other small invertebrates; occasionally seeds. Forages almost exclusively on the ground (at least 98% of time), mainly in dense cover; uses bill to flick litter aside, and probes and gleans prey from low vegetation.

**Breeding.** Season Jul-Jan: single brood per season. Monogamous; solitary, territorial throughout year. Male courtship-feeds female. Nest a cup of dried bark strips, grass and twigs, lined with finer twigs, grass and bark, external diameter 102 mm, depth 64 mm, internal diameter 70 mm, depth 48 mm; placed in depression in ground near base of tree, shrub or other object, with apron or platform (17.8–22.9 mm diameter) of dry twigs laid around rim; territory 2.7–7.1 ha (mean c. 4 ha). Clutch 1 egg, pale greenish or greyish-green, with brown and black spots and blotches concentrated at larger end, 25 × 19 mm; incubation by female or by both parents, period 16 days; chicks brooded by female, fed by both sexes, nestling period 10–13 days; fledglings fed by both parents. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Breeding success 50–64%.

**Movements.** Sedentary. Recaptures of marked individuals less than 10 km from original site of ringing.

**Status and Conservation.** Not globally threatened. Rather uncommon and patchily distributed; occurs in several isolated populations. Has declined in many parts of range; this associated with fragmentation as habitat is cleared for agriculture or otherwise degraded. Occurs in Wyperfeld National Park, in Victoria.

**Bibliography.** Boehm (1955), Boles (1988), Brooker, B. (1998b, 2001), Chandler, (1913), David & Gosselin (2002b), Harrison (1974a, 1976), Higgins & Peter (2002), Johnstone & Storr (2004), Mathews (1921), Schodde & Mason (1999), Sedgwick (1949), Serventy & Whittell (1976), Sharrock (1978), Storr (1947), Sullivan (1927).

## Subfamily EOPSALTRINAE

### Genus *HETEROMYIAS* Sharpe, 1879

## 5. Ashy Robin

### *Heteromyias albispecularis*

**French:** Miro cendré **German:** Weißbrauen-Farnschnäpper **Spanish:** Petroica Ceniza  
**Other common names:** Black-checked Robin, Ground Thicket-flycatcher, White-striped Flycatcher-robin

**Taxonomy.** *Pachycephala albispecularis* Salvadori, 1876, Tamrau and Arfak Mountains, New Guinea. Genus often subsumed in *Petroica*. Closely allied to and sometimes considered conspecific with *H. cinereifrons*; further research required. Racial identity of birds from Gautier Mts uncertain; tentatively included in *centralis*. Five subspecies recognized.

**Subspecies and Distribution.**

*H. a. albispecularis* (Salvadori, 1876) - NW New Guinea (Tamrau Mts, Arfak Mts).

*H. a. rothschildi* E. J. O. Hartert, 1930 - Weyland Mts and S slopes of Snow Mts, in WC New Guinea.

*H. a. centralis* Rand, 1940 - N & C New Guinea: Gautier Mts, and Wissel Lakes district and N slopes of C ranges from R Idenburg F. to Central Highlands.

*H. a. atricapilla* Mayr, 1931 - Adelbert Mts and mountains of Huon Peninsula, in NE New Guinea.  
*H. a. quinquata* (De Vis, 1894) - Hermit Mts and mountains of SE New Guinea.

**Descriptive notes.** 12–18 cm, 30–40 g. Somewhat pale on throat onto anterior cheeks white, rest of head rather dark ashy grey, hindneck slightly paler, upperparts olivaceous grey; remiges fus-



cous, outer webs edged olive-brown except on outer three primaries and innermost secondaries, which have blackish base on outer web and a blue patch on each web. Tertiaries olive-brown, lesser upperwing-coverts ashy grey, greater and primary coverts luscous black, other coverts olive-fuscos; tail fuscos, washed brown; chin grey, throat white, breast pale ashy, belly white, flanks and undertail-coverts rusty olive; iris dark brown; bill olive-brown, tip pale; legs pink. Sexes similar. Juvenile has body rufous, paler on underparts; immature similar to adult, but some greater upperwing-coverts tipped rufous-chestnut, bill pale with darker base.

Races rather distinctive: *rothschildi* has white supercilium from above eye to nape side, white bar from throat to eye, rest of head and hindneck black, upperparts olive-brown, inner secondaries as back, other remiges black with olive-brown edges, white or pale grey patch on centre of remiges (forming patch on folded wing, stripe in flight), central rectrices as back, others black with paler edges, chin black, throat white, breast grey, belly white, flanks and undertail-coverts ochraceous; *centralis* is like previous, but upperparts more greyish-olive, ochraceous of flanks reduced; *armillatus* is similar to last, but forehead greyish, crown tinged brown, back greenish-olive, uppertail-coverts more reddish-brown; *atricapilla* has crown black, tail darker rust-brown. **Voice.** Song a series of short ringing, bell-like notes. Call a much shortened version (2–5 notes) of song; alarm "kak-kaktak-kak". Also 3 or 4 clear, high-pitched ascending whistles, "yo-ba-go", and soft whistled "ee-ya ee-ya-weee"; also "who-he", first syllable lower than second.

**Habitat.** Montane forest at 1400–2600 m, mostly 1700–2400 m; locally as low as 850 m in W of range.

**Food and Feeding.** Insects, including beetles (Coleoptera), ants (Hymenoptera) and phasmids, larvae, centipedes (Chilopoda) and earthworms. Frequents undergrowth and ground; much of foraging (c. 75%) takes place on ground. Obtains food by gleaning (c. 20%) and in sally-strikes to low vegetation (c. 80%).

**Breeding.** Female in breeding condition in Jun, nestlings mid-Sept to early Oct, juvenile in early Nov and nest with egg in late Dec, indicating breeding from middle of dry season to early wet season, at least. Nest an untidy shallow cup of rootlets, tendrils, twigs, fibrous stems and leaves with a little moss, lined with fine rootlets; placed 0.9–3 m from ground on slender branchlet of sapling, next to main stem, or in small bush in dimly lit situation. Clutch 1 egg, pale cream, slightly olivaceous, blotched and spotted with browns, buff and purple-grey (markings densest on large end), 24.3 × 19.5 mm; no information on incubation and nestling periods; when nest or young threatened, adult performs injury-feigning distraction display on ground.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not assessed. Locally fairly common, but often scarce. Occasionally absent from apparently suitable areas.

**Bibliography.** Beehler (1978b), Coates (1990), Croxall (1977), David & Gosselin (2002b), Diamond (1972, 1985), Gilliard & LeCroy (1961b), Gyldenstolpe (1955a), Harrison & Frith (1970), Hartert (1930), Hartert *et al.* (1936), Hicks & Burrows (1989), Iredale (1956), Junge (1953), Rand (1940b), Salvadori (1881), Sims (1956).

## 6. Grey-headed Robin

### *Heteromyias cinereifrons*

**French:** Miro à tête grise **German:** Graustirn-Farnschnäpper **Spanish:** Petroica Cabecigris  
**Other common names:** Ashy-fronted Robin/Flyrobin, Grey-headed/Ground Thicket-flycatcher

**Taxonomy.** *Poecilodryas? cinereifrons* E. P. Ramsay, 1876, near Cardwell, Rockingham Bay, Queensland, Australia.

Genus often subsumed in *Poecilodryas*. Closely allied to and sometimes considered conspecific with *H. albispecularis*; further research required. Monotypic.

**Distribution.** Highlands of NE Queensland (from Mt Amos S to Mt Spec), in N Australia.



**Descriptive notes.** 18.5–20 cm; 31–40 g. Has crown and nape dark grey, grading into olive-brown on hindneck and side of neck; broad, diffuse pale grey supercilium merging into nape, sooty black lores, white broken eyering above and behind eye; ear-coverts sooty black anteriorly, grey-brown posteriorly; mantle to rump olive-brown, uppertail-coverts rufous-chestnut; upperwing dark olive-grey, white edges on marginal primary coverts and white stripe across remiges near base (forming wingbar), pale grey patch at leading edge near base of primaries, secondaries broadly edged olive; tail rufous-brown at base, grading to olive-brown distally, tips of outer three feather pairs narrowly edged white; chin sooty black, malar region and throat white, breast light grey, belly off-white, flanks and side of belly buff-olive, undertail-coverts washed with light orange-brown; iris dark brown; bill black, pale tip; legs greyish-pink. Sexes alike. Juvenile has body dull rufous, upperwing-coverts edged rufous; immature similar to adult, but wing-coverts edged rufous. **Voice.** Song monotonous, repeated whistles on even pitch, followed by 2 or 3 shorter lower notes. Whistle by male when delivering food to female, "cheep" by female in response; also "chuck" and chattering sounds.

**Habitat.** Rainforest and adjacent clearings and roads; usually above 200 m, occasionally lower in areas of continuous forest.

**Food and Feeding.** Insects and other invertebrates, including worms and molluscs, also small vertebrates. Forages mainly on the ground (more than 92% of time) among leaf litter, pounces on prey from elevated perch; rarely, gleans on trunks or elevated foliage.

**Breeding.** Season Jul-Aug-Jan/Feb; one or two broods per season. Territorial, probably throughout year. Male feeds female throughout most of breeding cycle. Nest built by female, a cup of twigs, roots, bark and leaf skeletons, some material may hang up to 60 cm below base, covered on outside with moss, lined with rootlets and fibre of lawyer-vine (*Calamus*), external diameter 114–117 mm, depth 61–102 mm, internal diameter 64–68 mm, depth 29 mm; built up to 4 m above ground, usually at c. 2 m, at junction of leaf and stem of lawyer-vine or in upright fork of shrub.

Clutch 1–2 eggs, cream, creamy buff or greenish-white, speckled and blotched with brown and purplish-grey, especially at larger end, underlaid with deep blushing-grey patches, average size 25.4 × 19 mm; laying sometimes delayed by up to 4 weeks after nest completion; incubation mostly by female (including up to 66% of diurnal period), period 17–19 days; chicks brooded by female,



mostly during first seven days, leave nest at 12–14 days; fledglings fed by both parents, remain dependent for at least 45 days; distraction display, with wing-quivering while moving slowly along ground, given by adults towards perceived threats near nest. In one study, 82.9% hatching success, 54% of nestlings fledged, overall 39% of nests produced young (0–7 fledglings per pair); nests preyed on by Black-eared Catbird (*Ailuroedus melanotis*), and nestlings attacked by parasitic flies. Greatest recorded longevity 13 years 6 months.

**Movements.** Mostly sedentary; some local altitudinal movements to lower elevations in non-breeding season. Almost all recaptures of marked individuals less than 10 km from original ringing site.

**Status and Conservation.** Not assessed. Restricted-range species: present in Queensland Wet Tropics EBA. Common and widespread in elevated areas within its small range.

**Bibliography.** Bardeleben *et al.* (2005), Boles (1988), Bourke & Austin (1947), Frith (1984), Frith & Frith (2000), Higgins & Peter (2002), Joseph & Moritz (1994), Joseph *et al.* (1995), Mack (1934b), Mathews (1920c), Moritz & Faith (1998), Schodde & Mason (1999), Wieneke (1992b), Williams *et al.* (1993).

## Genus *POECILODRYAS* Gould, 1865

### 7. White-browed Robin

#### *Poecilodryas superciliosa*

**French:** Miro bridé **German:** Augenstreifenschnäpper **Spanish:** Petroica Cejuda  
**Other common names:** White-browed Flycatcher/Flyrobin/Shrike-robin, White-winged Flyrobin, White-eyebrowed Robin

**Taxonomy.** *Petroica superciliosa* Gould, 1847, near Burdekin Lakes, Queensland, Australia. Traditionally treated as conspecific with *P. cerviniventris*, but differences between the two in size and plumage now generally accepted as sufficient to warrant treatment as separate species. Monotypic.

**Distribution.** NE Queensland (Cape York S to Mackay region), in NE Australia.



**Descriptive notes.** 14–16 cm; male 17–22 g, female 15.5–17 g. Has broad white supercilium from base of bill back to nape, sooty-brown stripe from lores through eye and above ear-coverts to nape side, dark olive-brown ear-coverts streaked with white (particularly below orbit); crown and hindneck olive-brown to grey-brown, upperparts dark olive-brown; upperwing dark olive-brown, remiges with broad white patch near bases and white edging (particularly on inner primaries and secondaries) and outer secondary coverts with white tips (forming Y-shaped wingbar on folded wing, white stripe in flight); tail dark

olive-brown, all except central pair of feathers broadly tipped white; white below, breast side with light grey wash, feathers on side of neck curling up behind ear-coverts; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile has body rufous, wing and tail as adult, upperwing-coverts with rufous edging; immature similar to adult, except for rufous edging on wing-coverts. Voice: Song a piping whistle, "tit-toe-ee-toe-ee tit-toe-ee-toe-ee tit-toe". Contact call drawn-out whistles; chattering notes as alarm.

**Habitat.** Rainforest, ecotone between rainforest and adjacent eucalypt (*Eucalyptus*) woodland, riparian vegetation including pandanus and bamboo, vine scrub, and tea-tree (*Leptospermum*) swamps; from coast to foothills.

**Food and Feeding.** Insects and other small arthropods; also seeds. Forages mainly on ground, pouncing on prey from elevated perch; feeds also in foliage and on trunks of shrubs and trees. Occasionally flycatches.

**Breeding.** Season Jul–Jan; one or two broods per season. Solitary breeder; territorial. Courtship involves flights and chases by pair-members. Nest built by female, a cup woven from rootlets, tendrils and bark strips, bound with web and occasionally with lichen added to external surface, lined with rootlets, tendrils, plant fibres and grass, external diameter 76–83 mm, height 32–51 mm, internal diameter 50 mm, depth 20–38 mm; placed 1–11 m (usually c. 3 m) above ground in thin horizontal or vertical fork of tree, shrub or vine tangle in dense vegetation. Clutch 1–2 eggs, pale green or bluish-green, blotched and spotted in shades of brown and grey (sometimes forming zone at larger end), sometimes with underlying lilac markings, average 19.7 × 14.4 mm; incubation by female, period 16 days; chicks fed by both sexes, leave nest at 9 days; if two fledglings, each attended by one parent. Greatest recorded longevity 8 years 11 months.

**Movements.** Sedentary. All recoveries of marked birds less than 10 m from site of original ringing.

**Status and Conservation.** Not assessed. Generally common, but occurrence patchy; strongly associated with riverine vegetation.

**Bibliography.** Boles (1988), Bourke & Austin (1947), Campbell (1901), Chisholm (1960), Higgins & Peter (2002), Keast (1958b), Macgillivray (1914, 1918), Mathews (1920d), North (1903), Officer (1969), Schodde & Mason (1999), Storr (1953), Taylor (1994), Wheeler (1967).

### 8. Buff-sided Robin

#### *Poecilodryas cerviniventris*

**French:** Miro à flancs chamois **German:** Isabellflankenschnäpper **Spanish:** Petroica Ventricanella

**Taxonomy.** *Petroica? cerviniventris* Gould, 1858, Victoria River, north-western Australia. Conventionally treated as conspecific with *P. superciliosa*, but differences between the two in size and plumage now generally accepted as sufficient to warrant treatment as separate species. Monotypic.

**Distribution.** NE Western Australia, N Northern Territory and extreme NW Queensland, in N Australia.

**Descriptive notes.** 16–18 cm; male 20–25 g, female 15.5–20 g. Has broad white supercilium from base of bill to nape, sooty-brown stripe through lores, eye and over ear-coverts to nape, dark olive-brown moustachial region and ear-coverts with little white streaking; crown, hindneck and upperparts olive-brown to grey-brown, upperwing dark olive-brown, remiges with broad white patch near bases and white edgings (particularly on inner primaries and secondaries) and outer secondary



coverts with white tips; tail dark olive-brown, all except central pair of feathers broadly tipped white; chin, throat, breast and belly white, side of breast with grey wash, belly side, flanks and undertail-coverts cinnamon-buff; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile has body rufous, wing and tail as adult but upperwing-coverts with rufous edging; immature similar to adult, except for rufous edging on wing-coverts. Voice: Song 2–4 loud whistles.

**Habitat.** Dense riparian vegetation, including pandanus and bamboo, paperbark (*Melaleuca*) swamps, monsoon forest, occasionally man-

groves. Lowlands.

**Food and Feeding.** Invertebrates, mainly insects; some seeds. In study in monsoon forest, 30% of foraging on ground and remainder in outer foliage; of latter, 15% at height of 0–1 m, 40% at 1–2 m, 10% at 4–7 m, and 5% at 8–14 m.

**Breeding.** Season Oct–Mar; one or two broods. Solitary breeder; territorial. Nest built by female, a woven cup of rootlets, tendrils and bark strips, bound with web, occasionally with lichen added to external surface, lined with rootlets, tendrils, plant fibres and grass, external diameter 73–102 mm, height 51–76 mm, internal diameter 38–81 mm, depth 53–64 mm; placed, usually within 3 m of ground, in thin horizontal or vertical fork of tree, shrub or vine tangle in dense vegetation. Clutch 2–3 eggs, yellowish-green with reddish-brown markings and underlying pale purplish-red blotches, average 19 × 14.3 mm; incubation by female, chicks fed by both sexes; no information on duration of incubation and nestling periods, presumably similar to those of *P. superciliosa* (16 and 9 days, respectively); fledglings fed by both parents.

**Movements.** Sedentary, or some small local movements.

**Status and Conservation.** Not assessed. Generally common. Appears to be declining as a result of destruction and degradation of riparian vegetation by cattle and feral animals.

**Bibliography.** Boles (1988), Campbell (1901), Galbraith (1974a), Hall (1902), Higgins & Peter (2002), Hill (1911), Johnstone & Storr (2004), Keast (1958b), Le Souëf (1902), Macgillivray (1914), Mathews (1920d), North (1903), Officer (1969), Schodde & Mason (1999), Whitlock (1925), Woinarski *et al.* (2000).

### 9. Black-sided Robin

#### *Poecilodryas hypoleuca*

**French:** Miro à flancs noirs **German:** Schwarzflankenschnäpper **Spanish:** Petroica Flanqueigra  
**Other common names:** Black-sided Flyrobin, Black-and-white Robin/Flycatcher-robin/Thicket-flycatcher, Pied Robin

**Taxonomy.** *Petroica hypoleuca* G. R. Gray, 1859, Manokwari, Vogelkop, New Guinea.

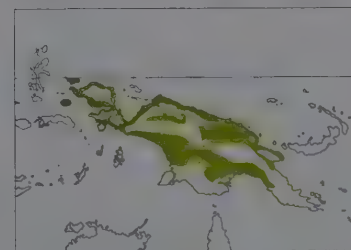
Three subspecies recognized.

**Subspecies and Distribution.**

*P. h. steini* Stresemann & Paludan, 1932 – Waigeo, in West Papuan Is (off NW New Guinea).

*P. h. hypoleuca* (G. R. Gray, 1859) – West Papuan Is (Salawati, Misool), and NW & S New Guinea (E to head of Geelvink Bay and, in S, to R Brown).

*P. h. hermani* Madarász, 1894 – N New Guinea (from R Mamerano) E to Morobe area, on S side of Huon Gulf.



**Descriptive notes.** 13–15 cm; 18 g. Nominate race has white supercilium from bill to behind eye, white patch beneath eye; crown, side of head and upperparts black; upperwing and tail black, remiges with broad white patch near bases (forming bar on folded wing, prominent stripe in flight); white below, black patch on side of breast; iris dark brown; bill black; legs grey. Sexes alike. Juvenile is plain brown on crown and back, darker brown on chin, breast and flanks, and white on abdomen and undertail-coverts; immature as adult, but retains juvenile wing-coverts. Races differ minimally: *steini* is browner above than nominate;

*hermani* has upperparts blacker, and white supraloral spot and wing patch larger. Voice: Song 4 short whistled notes, rising and then falling, "ti-tu-tu tu". Call a loud whistled "poop-chew", second note louder and descending.

**Habitat.** Rainforest, swamp-forest with sago palm (*Metroxylon*); locally also secondary growth, particularly where sympatric with *P. brachyura*; will enter relatively open forest with little ground cover. Mainly in lowlands, but extends to hills (750–1200 m) in absence of competitor species.

**Food and Feeding.** Insects. Frequents lower understorey, usually within a few metres of ground, occasionally up to 15 m. In studies, c. 35% of feeding done in lower forest storey, c. 45% in undergrowth and c. 25% on ground; prey obtained by gleaning (c. 45%) and in sally-strikes (c. 45%) from bark, foliage and ground, sometimes by aerial flycatching (c. 10%).

**Breeding.** Season reported as Sept–Jan, and fledgling seen in late Dec; male in breeding condition in May and female having just finished laying in Apr, indicating breeding also in late dry season. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Fairly common to common; often shy and difficult to observe, and presence revealed mostly by distinctive voice. At rainforest study site near R Brown (in extreme SE of range), population estimated to be 6 birds/10 ha.

**Bibliography.** Beecher (1978b), Bell (1982b, 1982c), Coates (1990), Croxall (1977), Hartert (1930), Iredale (1956), Mayr & Rand (1937), Rand (1942a, 1942b), Rothschild & Hartert (1903c), Salvadori (1881).

### 10. Black-chinned Robin

#### *Poecilodryas brachyura*

**French:** Miro à menton noir **German:** Kurzschwanzschnäpper **Spanish:** Petroica Barbinegra  
**Other common names:** New Guinea Robin/Flyrobin, White-breasted Robin(!)/Flyrobin, Short-tailed Flycatcher-robin

**Taxonomy.** *Leucophantes brachyurus* P. L. Selater, 1874, Andai, north-west New Guinea.



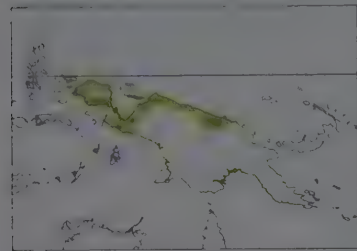
Three subspecies recognized.

**Subspecies and Distribution.**

*P. b. brachyura* (P. L. Selater, 1874) – W New Guinea (Vogelkop, Wandammen Mts, Weyland Mts).

*P. b. albonotata* (A. B. Meyer, 1874) – Yapen I and R Mamberano, in N New Guinea.

*P. b. dumasi* Ogilvie-Grant, 1915 – N New Guinea from Humboldt Bay E to R Sepik.



**Descriptive notes.** 14–15 cm; 25 g. Nominative race has broad white supercilium from slightly in front of eye to side of nape, crown and side of head black, upperparts dark grey; upperwing and tail black, white patches on outer webs of inner primaries and secondaries (forming bar on folded wing, broad stripe in flight); chin black, throat and underparts white; iris dark brown; bill black; legs whitish-brown. Sexes alike. Juvenile undescribed, probably much browner generally than adult. Race *albonotata* is darker than nominate, has smaller black chin patch; *dumasi* is like nominate but upperparts black. Voice. Song a short whistled note repeated about nine times in rapid descending series.

**Habitat.** Forest in lowlands and foothills, to 650 m.

**Food and Feeding.** Insects. Frequents lower and middle stages of forest. Reportedly forages by aerial flycatching.

**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally not uncommon. General biology and ecology poorly known.

**Bibliography.** Coates (1990), Hartert (1930), Iredale (1956), Mayr (1941a), Ogilvie-Grant (1915), Salvadori (1881), Stein (1936).

## 11. Black-throated Robin

### *Poecilodryas albonotata*

**French:** Miro à gorge noire **German:** Halsfleckenschnäpper **Spanish:** Petroica Gorjinegra  
**Other common names:** Black-bibbed Robin, Black-throated Flycatcher/Thicket-flycatcher, White-spotted Flycatcher-robin

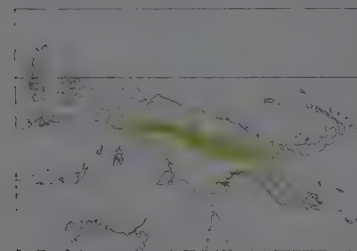
**Taxonomy.** *Megalestes albonotatus* Salvadori, 1875, Arfak Mountains, New Guinea. Formerly placed in a monotypic genus, *Plesiodyras*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. a. albonotata* (Salvadori, 1875) – N Vogelkop (Tamrau Mts, Arfak Mts), in NW New Guinea.

*P. a. griseiventris* Rothschild & E. J. O. Hartert, 1913 – C New Guinea from Weyland Mts, Wissel Lakes district and Snow Mts E to Central Highlands.

*P. a. correcta* E. J. O. Hartert, 1930 – mountains of Huon Peninsula and SE New Guinea (E from Aseki area).



**Descriptive notes.** 18–19 cm; 38–43 g. Nominative race has crown and upperparts deep blue-grey, side of forehead to ear-coverts black; upperwing blackish-brown, outer webs of remiges with small white spot (not visible on folded wing, but forming stripe in flight); tail blackish-brown, outer rectrices narrowly tipped white; chin, throat and upper breast black, side of neck with elongated white patch, breast side and flanks grey, lower breast to undertail-coverts white; iris dark brown; bill and legs black. Sexes alike. Juvenile has plumage uniform pale cinnamon, except for white mark on neck side. Race *griseiventris* has lower

breast and belly grey, not white; *correcta* is paler above than nominate, has black of throat more restricted, extent of white on underparts less and tinged buff. Voice. Song 2–4 high-pitched, thin, drawn-out upslurs or downslurs. Also a ringing note typical of other petroicids.

**Habitat.** Mountain forest and secondary growth, mainly at c. 1800–2750 m, locally down to 1150 m.

**Food and Feeding.** Insects. Frequents mainly higher levels, occasionally descending to lower levels. In studies, found usually to forage 6–20 m from ground in middle storey (c. 30% of observations) and lower storey (c. 55%), sometimes in understorey (c. 15%). Insects captured by aerial flycatching (c. 80%) and by gleaning from vegetation (c. 20%).

**Breeding.** Female in breeding condition in late Sept, fledglings being fed in mid-Feb and juveniles seen in Feb and late Nov, indicating breeding in late dry season and middle of wet season, at least. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Widely distributed, but considered to be generally uncommon.

**Bibliography.** Anon. (1986), Beehler (1978b), Beehler *et al.* (1986), Coates (1990), Croxall (1977), Diamond (1972), Gilliard & LeCroy (1961b), Gyldestolpe (1955a), Hartert (1930), Iredale (1956), Mayr (1941a), Mayr & Rand (1937), Rand & Gilliard (1967), Rothschild & Hartert (1913), Salvadori (1881).

## 12. Olive-yellow Robin

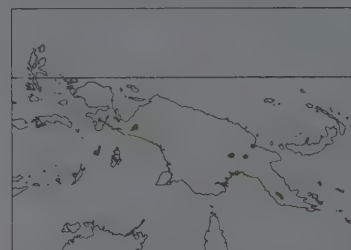
### *Poecilodryas placens*

**French:** Miro ceinturé **German:** Olivbandschnäpper **Spanish:** Petroica Bandedea  
**Other common names:** Banded Robin/Flyrobin/Flycatcher, Yellow Thicket-flycatcher, New Guinea Yellow Shrike-robin

**Taxonomy.** *Eopsaltria placens* E. P. Ramsay, 1879, Goldie River, south-east New Guinea.

Formerly placed in a monotypic genus, *Genendryas*. Possibly closer to *Eopsaltria* species than to current congeners; further study required. Monotypic.

**Distribution.** Scattered localities in New Guinea, including Batanta I, Wandammen Mts, Bomberai Peninsula, Weyland Mts, Astrolabe Bay, L Kutubu, Mt Bosavi, Karimui, and several localities in SE (e.g. R Angabunga–R Goldie area).



**Descriptive notes.** 14–15 cm; 24–28 g. Has dark grey head, olive-green upperparts; upperwing dusky brown, remiges narrowly edged olive-green, tail dusky brown; chin and upper throat dark grey, throat side and underparts bright yellow, dark olive-green breast-band; iris dark brown; bill black; legs pale yellow to orange. Sexes alike. Juvenile is apparently entirely or largely rufous (based on colour of residual nestling feathers on some specimens); immature as adult, but retaining juvenile upperwing-coverts. Voice. Song of 5 bell-like notes, first 2 slightly shorter than next 3, which run together, “tu-tu-tootootoo”.

Possible agonistic call 7 fairly loud, cicada-like vibrating and whining notes; also rapid “pop-tidipop-tidipop-tidipop” whistle, apparently during territorial disputes; also 2-note whistle, “wouw-wouw”.

**Habitat.** Primary foothill forest and hill forest, at 100–1450 m, altitudinal range at any single locality usually not more than 700 m, sometimes much less; from W to E, 850–880 m on Batanta I, 710–1450 m at Wandammen Mts, 300–1000 m at Weyland Mts (where much more common at lower altitudes), and 100–350 m in region between R Angabunga and R Goldie. Frequents most shaded parts of forest with relatively open understorey.

**Food and Feeding.** Insects. Usually found 0.6–1.5 m from ground, occasionally lower, rarely higher. Captures prey by pouncing from perch on to ground or fallen debris; also by making sally-strikes, but only occasionally by aerial flycatching. Food taken to a horizontal perch, where it is beaten before being consumed.

**Breeding.** Few data; only two completed nests and a one incomplete one described. Adults with enlarged gonads in Jul and immatures seen in Jun–Jul at one site; elsewhere, fully feathered nestling on 22nd Aug and small nestling at end Sept. Possible territorial dispute between two pairs involves short chases and calling. Nest a shallow bowl finely woven from epiphyte roots and similar plant material, with moss on outside, one with external diameter 9 cm, internal diameter 5 cm, another with internal depth c. 1 cm, placed 0.75–2.1 m up on side branch of low understorey tree or sapling. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in West Papuan Lowlands EBA, North Papuan Lowlands EBA, South Papuan Lowlands EBA and South-east Papuan Lowlands Secondary Area. Very patchy in occurrence, but locally fairly common to common. Sometimes the most widespread petroicid at its altitudinal range; at Vaimuri and Kuriva (SE New Guinea), possibly the commonest passerine in lower-forest interior.

**Bibliography.** Anon. (2006c), Butchart & Stattersfield (2004), Coates (1990), Collar *et al.* (2001), Diamond (1972, 1985), Finch (1979), Greenway (1966), Hartert *et al.* (1936), Iredale (1956), Mayr (1941a), Ramsay (1879), Rand & Gilliard (1967), Salvadori (1881), Sharpe (1879b), Stattersfield & Capper (2000), Stein (1936), Symes & Marsden (2005).







PLATE 38

inches 3  
cm 8

## Genus *TREGELLASIA* Mathews, 1912

### 13. Pale-yellow Robin

#### *Tregellasia capito*

**French:** Miro jaunâtre **German:** Fahlgesichtschnäpper **Spanish:** Petroica Amarillenta  
**Other common names:** Buff-faced/Large-headed/Pale Robin; Northern Pale-yellow/Rufous-lored Robin (*nana*); Southern Pale-yellow Robin (*capito*)

**Taxonomy.** *Eopsaltria Capito* Gould, 1854, Brisbane River, Queensland, Australia. Precise relationship of present genus with *Eopsaltria* uncertain; subsumed unto that genus by some earlier authors, but most recent authors maintain two separate genera. Two subspecies recognized.  
**Subspecies and Distribution.**  
*T. c. nana* (E. P. Ramsay, 1878) – NE Queensland (Cooktown district S to Cardwell and Hinchinbrook I), in NE Australia.  
*T. c. capito* (Gould, 1854) – coasts of SE Queensland and NE New South Wales (E Australia).



**Descriptive notes.** 12–13.5 cm; 14.5–16 g (*capito*), 12–14.5 g (*nana*). Nominant race has off-white side of forehead and lores, grey face, faint pale buff eyering, dark grey ear-coverts; crown, nape and neck side dark grey, merging with greyish-olive upperparts; upperwing olive-brown, pale stripe across primaries and inner secondaries (visible in flight); tail olive-brown, pale edging at tips of rectrices when plumage fresh; chin and upper throat white, lower throat lemon-yellow, underparts dull lemon-yellow, sides of breast and belly and flanks washed with olive; iris dark brown; bill black; legs dull pinkish-orange. Sexes alike.

Juvenile has body rufous, paler on belly, with scattered pale streaks on head, upperwing-coverts edged rufous; immature similar to adult, but wing-coverts edged rufous. Race *nana* is somewhat smaller than nominate, and has lores and eyering pale rufous. Voice. Song a repetition of middle-pitched to high-pitched squeaks, “see-see-see-see-see”, increasing in speed, pitch and volume. Contact call a soft trill; alarm a harsh scold; also, a double squeak and a soft “soo-soo-soo”.

**Habitat.** Rainforest, especially areas with abundant lawyer-vine (*Calamus*), and adjacent dense, moist eucalypt (*Eucalyptus*) forest. Sea-level to 1500 m; more abundant at lower altitudes.

**Food and Feeding.** Insects and other small invertebrates; some seeds. Frequents lower to middle strata. Forages mainly by pouncing on prey on ground from elevated perch, usually below 10 m, more often below 2 m; occasionally hunts from canopy, at up to 18 m. Sometimes obtains food by gleanings, less often by aerial sallying.

**Breeding.** Season Aug–Dec, sometimes to Jan in N; one or two broods. Breeds as simple pair, or in group consisting of breeding male, one or two females and one or two auxiliary males; male feeds female throughout breeding season. Territorial throughout year. Nest built by breeding female, construction taking 7–15 days, a neat open cup of grass, vine tendrils, bark strips and plant fibre, bound with spider web, covered externally with bark, lichen and moss, placed 1–10 m (usually 3–3.5 m) above ground in fork of sapling or lawyer-vine or at junction of small branch and main stem, in dense vegetation near stream; territory 0.7–1 ha, larger in unlogged areas. Clutch 2 eggs, light green or greenish-white, spotted or blotched with various shades of brown (especially near larger end), average 20.3 × 15.6 mm (somewhat smaller in N of range); incubation by breeding female, period 14–18 days; chicks brooded by main female, fed by all members of group, nestling period 15–19 days; if nest approached, adult performs distraction display by fluttering on ground while moving away from nest; after leaving nest, young move to dense vegetation for several days, when fed by all group-members, and each then follows different parent, fed for 7–8 weeks, independent at 10–11 weeks. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*) and Horsfield’s Bronzeflycatcher (*Chrysococcyx basalis*). Nest predators include Pied Currawong (*Strepera graculina*) and southern angle-headed dragon (*Hypsilurus spinipes*). Greatest recorded longevity 13 years 11 months.

**Movements.** Sedentary. Young disperse c. 500–600 m from nest; all recoveries of marked birds less than 10 km from site where first ringed.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Queensland Wet Tropics EBA and Eastern Australia EBA. Common in N of range (race *nana*) and uncommon in S (nominate). Sensitive to fragmentation and loss of habitat for agriculture and stock-rearing. Avoids recently created gaps, and nests more than 30 m away from them. Disappears from small forest patches. Returns to selectively logged and clear-felled forests 20–30 years after operations.  
**Bibliography.** Barrett *et al.* (2003), Bourke & Austin (1947), Chisholm (1960), Cracraft (1986), Crome (1978), Favalloro (1931), Galbraith (1974a), Higgins & Peter (2002), Jackson (1909a), Keast (1958b), Male (2000), Mathews (1920d), McFarland & Nias (1985), North (1903), Officer (1969), Schodde & Mason (1999).

### 14. White-faced Robin

#### *Tregellasia leucops*

**French:** Miro à face blanche **German:** Weißgesichtschnäpper **Spanish:** Petroica Cariblanca  
**Other common names:** Little/White-throated Robin, White-faced Yellow Robin, White-faced Flycatcher-(robin)

**Taxonomy.** *Leucophantes leucops* Salvadori, 1876, Arfak Mountains, Vogelkop, New Guinea. Precise relationship of present genus with *Eopsaltria* uncertain; subsumed unto that genus by some earlier authors, but most recent authors maintain two separate genera. Population of Farfak Mts belongs to *leucops-mayri-nigroorbitalis* group, but precise subspecific identity has not yet been determined; likewise, populations on Yapen I and in Foja Mts belong to *heurni-nigriceps-melanogenys* group, but subspecific identity yet to be determined; each indeterminate population may represent a new taxon. Ten subspecies provisionally recognized.

#### Subspecies and Distribution.

*T. l. leucops* (Salvadori, 1876) – Vogelkop (Tamrau Mts, Arfak Mts) and Bomberai (Kumawa Mts), in NW New Guinea.  
*T. l. mayri* (E. J. O. Hartert, 1930) – Wandammen Mts and adjacent part of Weyland Mts, in W New Guinea.  
*T. l. nigroorbitalis* (Rothschild & E. J. O. Hartert, 1913) – WC New Guinea (S slopes of Nassau Mts and Oranje Mts).  
*T. l. heurni* (E. J. O. Hartert, 1932) – WC New Guinea (Weyland Mts, mountains on upper R Mamberamo).  
*T. l. nigriceps* (Neumann, 1922) – C New Guinea (S slopes of E Oranje Mts, Victor Emanuel Mts).  
*T. l. melanogenys* (A. B. Meyer, 1893) – N & NE New Guinea (Cyclops Mts E to R Aicora).  
*T. l. wahgiensis* Mayr & Gilliard, 1952 – EC New Guinea (Kubor Range, Wahgi Mts and R Aroa area).  
*T. l. auricularis* (Mayr & Rand, 1935) – Wuroi, on R Oriomo, in S New Guinea.  
*T. l. albifacies* (Sharpe, 1882) – mountains of SE New Guinea (E from Hydrographers Mts in N, and inland from Port Moresby in S).  
*T. l. albigularis* (Rothschild & E. J. O. Hartert, 1907) – N Queensland (NE Cape York Peninsula), in N Australia.  
Also present (races uncertain) in Yapen I, Farfak Mts (Onin Peninsula) and Foja Mts.



**Descriptive notes.** 11.5–14.5 cm; 15.3–19.4 g. Nominant race has large white loreal spot, black line from gape to eye and eyering, dark slaty ear-coverts; crown dark slaty grey, paler grey on nape and side of neck, forehead and side of crown sooty black, upperparts yellowish-olive; median and lesser upperwing-coverts olive-green, remiges olive-brown with olive-green edges; tail olive-brown, rectrices finely tipped yellowish-white and edged with olivaceous-brown wash; chin, upper throat and cheek off-white, lower throat to undertail-coverts bright yellow, breast side and flanks washed olive; iris dark brown; bill black; legs orange-yellow.

Sexes alike. Juvenile has body rusty brown, some feathers with pale shaft streaks, upperwing-coverts tipped chestnut-rufous; immature similar to adult, but with light rufous edges on wing-coverts. Races differ mainly in head pattern and bill colour: *mayri* like nominate, but lacks black line from gape to eye; *nigroorbitalis* similar to previous, but with crown blacker and upper throat whiter; *heurni* has face (lores, forehead, eyering) entirely white; *nigriceps* similar to previous, but reduced white throat patch; *melanogenys* also very similar, but chin yellow, nape washed olive; *albifacies* has forehead black, crown olive-green, large white eyering; *albigularis* differs from last in blacker crown, more extensive white throat, somewhat paler underparts; *wahgiensis* has crown olive-green, more extensive white around eye, bill mostly orange; *auricularis* similar to last, but with throat and ear-coverts white. Voice. Song in New Guinea a whistled phrase of three connected syllables, second higher than others, followed immediately by 2 progressively higher notes, “wutieu-whi-whi”; in Australia (*albigularis*) 5 musical notes. Calls include series of c. 9 nasal notes, dropping somewhat in pitch at end, and short “tsip” repeated indefinitely; in Australia a repeated “chee chee”; also scolding notes.

**Habitat.** In New Guinea mainly forests of oak (*Quercus*) and southern beech (*Nothofagus*) growing to c. 30 m tall; usually only in hills and lower mountains at 300–2200 m, mainly 600–1650 m, also locally in lowlands in S Trans-Fly region. In Australia (race *albigularis*) inhabits tropical rainforest and vine thickets in lowlands and low mountain ranges.

**Food and Feeding.** Insects and other small arthropods; occasionally seeds. Frequents substage to upper middle stage, foraging in lower storey and undergrowth. Catches food items by pouncing, by gleanings, by making sally-strikes and in aerial sallies in low vegetation.

**Breeding.** In New Guinea, nest-building and recently completed nest in late Jul, nests with eggs in early Jan, and juveniles seen in late Apr, early Jul, mid-Aug and late Sept, thus most breeding appears to take place in middle of dry season, with some also in wet season; in Australia, breeds Sept/Oct–Jan, or perhaps earlier and with two peaks (Aug–Oct and Jan). Nest built by one member of pair, probably female, a neat cup made mostly of fine plant fibres and bark strips, bound externally with spider web, lined with fine material, outer covering of moss, dried grasses, fibres and tendrils, external diameter 5.7–7 cm, height 6.4–7.6 cm, internal diameter 4.4 cm, depth 3.8–4.4 cm; placed 1–9 m (usually c. 3.8 m) from ground in upright fork of sapling or lawyer-vine (*Calamus*). Clutch 2 eggs, light green, with brown and grey speckles concentrated towards larger end, size 19.3–19.6 × 14.5–14.7 mm; incubation by one partner, probably female; no information on duration of incubation and nestling periods. Greatest recorded longevity 9 years.

**Movements.** Mostly sedentary. More than 95% of marked individuals retrapped were recovered less than 10 km from site where initially ringed, but a few movements of 50–99 km also recorded. One retrapped 9 years later at original ringing site.

**Status and Conservation.** Not globally threatened. In New Guinea, widespread and fairly common to common, but scarce in some areas; reasonably common in Australia. Occurs in Varirata National Park, in New Guinea.

**Bibliography.** Barrett *et al.* (2003), Beeher (1978b), Bell (1971), Boles (1988), Campbell (1901, 1916), Clapp (1992), Coates (1990), Cracraft (1986), Crome (1977), Diamond (1972, 1985), Frith & Frith (1993a), Gilliard & LeCroy (1961b), Gyldenstolpe (1955a), Hardy & van Gessel (1992), Harrison & Frith (1970), Higgins & Peter (2002), Iredale (1956), Keast (1985), Macgillivray (1914, 1918), Mathews (1920d), Mayr (1941a), North (1903), Officer (1969), Rothschild & Hartert (1903c), Salvadori (1881), Schodde & Mason (1999).

## Genus *EOPSALTRIA* Swainson, 1832

### 15. White-breasted Robin

#### *Eopsaltria georgiana*

**French:** Miro à poitrine blanche **German:** Weißbrustschnäpper **Spanish:** Petroica Pechiblanca

On following pages: 16. Eastern Yellow Robin (*Eopsaltria australis*); 17. Western Yellow Robin (*Eopsaltria griseogularis*); 18. Yellow-bellied Robin (*Eopsaltria flaviventris*); 19. Mangrove Robin (*Peneoanthe pulverulenta*); 20. Slaty Robin (*Peneothello cyanus*); 21. Smoky Robin (*Peneothello cryptoleuca*); 22. White-rumped Robin (*Peneothello himaculata*); 23. White-winged Robin (*Peneothello sigillata*); 24. Hooded Robin (*Melanodryas cucullata*); 25. Dusky Robin (*Melanodryas vittata*); 26. White-eyed Robin (*Pachycephalopsis poliosoma*); 27. Green-backed Robin (*Pachycephalopsis hattamensis*); 28. Garnet Robin (*Eugerygone rubra*).

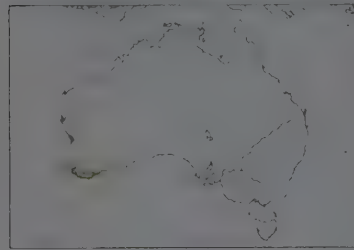


**Other common names:** Australian White-breasted Robin, White-bellied Robin, White-breasted Shrike-robin

**Taxonomy.** *Muscicapa georgiana* Quoy and Gaimard, 1830, King George Sound, Western Australia, Australia.

**Monotypic**

**Distribution.** SW Australia: SW coastal region of Western Australia from N of Geraldton S, discontinuously, to region of Albany.



**Descriptive notes.** 15–16.5 cm; male 19–22.5 g, female 15–19 g. Has head and upperparts sooty grey, lores black; upperwing sooty black, white patches across bases of inner primaries and secondaries (obscured on folded wing, visible as wingstripe in flight); tail dark grey with white tips on inner webs, tips narrow on central feathers and broadening towards outers, forming white corners of tail; chin, throat and underparts white, breast with pale grey wash; iris dark brown; bill and legs black. Sexes similar. Juvenile has upperparts, breast and flanks rufous-brown with pale shaft streaks; immature similar to adult, but retains juvenile wing-coverts with pale streaks. Voice. Song a whistled double note, “see-ow”. Alarm calls a single or double “chic” and grating “zhzhurr”; also a single repeated “zip” and soft twitterings and whistles.

**Habitat.** N population inhabits dense coastal thickets of acacia (*Acacia*) and paperbark (*Melaleuca*); S population occurs in wet eucalypt forest of karri (*Eucalyptus diversicolor*) and jarrah (*Eucalyptus marginata*), where it inhabits dense undergrowth and stream or gulley vegetation.

**Food and Feeding.** Insects and other small arthropods. Most prey captured by pouncing from an elevated perch to ground (76% of attacks); also taken below 1 m (15%) and at 1–2 m (9%). Substrates exploited are ground (76%), foliage (16%) and trunks and branches (5%), with remaining 3% of prey caught in air.

**Breeding.** Season Jun–Jan; 2–3 clutches per season. Breeds as pair, but often up to three helpers at nest (mostly males); male and helpers feed breeding female. In courtship display, male cocks tail, fluffs out body feathers, and bows head and body while making excited calls. Nest built by female, a loose to tight cup of grass, fine twigs and rootlets, usually bound with spider web and decorated externally with moss and lichen, external diameter 9 cm, height 6 cm, internal diameter 5 cm, depth 2–3 mm; placed 0.5–10 m (usually c. 2.5 m) from ground in upright or slanting fork in dense undergrowth. Clutch 1–3 eggs, usually 2, light olive-brown or olive-blue with faint reddish marks, average 21.3 × 15.6 mm; incubation by female, period 14–15 days; nestlings fed by male and by any helpers present, leave nest at 12–14 days; fledglings fed by all adults; adults and helpers perform distraction display by running on ground with wings spread. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Hatching success 63–80%, and 73–87% of hatchlings fledge, producing success rate of 0.9–1.32 young per nest; nest predators include cats and various birds. Longevity up to 12 years.

**Movements.** Sedentary. Young females disperse, while young males often remain with parents as helpers. In one study, 99.5% of 1373 marked individuals recovered at site of original ringing. Only one record of movement greater than 10 km (c. 13 km).

**Status and Conservation.** Not globally threatened. Restricted-range species: present in South-west Australia EBA. Common. Reaction to disturbance uncertain; in some studies this species showed a decline or a neutral response to fire. Generally most abundant c. 5 years after burning, and most abundant 6–12 years after cessation of logging activities.

**Bibliography.** Abbott (1999), Barrett *et al.* (2003), Boles (1988), Brown & Brown (1978, 1980), Brown *et al.* (1990), Ford (1971b, 1979a), Ford & Teague (1959), Galbraith (1974a), Higgins & Peter (2002), Johnstone & Storr (2004), Keast (1958b, 1961, 1985), Mathews (1920c), North (1903), Officer (1969), Pepper (1965), Russell *et al.* (2004), Schodde & Mason (1999), Serventy & Whittell (1976), Stranger (1967), Whittell (1933a, 1933b, 1952), Wooller & Calver (1981, 1988).

## 16. Eastern Yellow Robin

### *Eopsaltria australis*

**French:** Miro à poitrine jaune **German:** Goldbauchschnäpper **Spanish:** Petroica Amarilla  
**Other common names:** Yellow Robin, Bark/Creek/Yellow-breasted Robin, Yellow-breasted Shrike-robin; Southern Yellow Robin (*australis*); Northern Yellow Robin, Golden-rumped/Golden-tailed Robin (*chrysorhchos*)

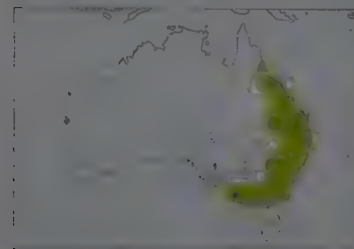
**Taxonomy.** *Motacilla Australis* Shaw, 1790, New South Wales, Australia.

Closely related to, and sometimes treated as conspecific with, *E. griseogularis*. N race *chrysorhchos* has in the past been considered a separate species. Geographical variation rather complex, and up to six races have been recognized on basis of differences in rump and abdomen colours and bill length, but this variation somewhat clinal. Described race *magistris* (from NE Queensland) merged with *chrysorhchos*, and *viridior* (SE South Australia and Victoria) with nominate; *camochoholaro* (SC Queensland) and *austina* (interior of N & C New South Wales) are considered to be intergrades between nominate and *chrysorhchos*. Two subspecies currently recognized.

**Subspecies and Distribution.**

*E. a. chrysorhchos* Gould, 1869 – E Australia from NE Queensland (E of Great Dividing Range) S to NE New South Wales

*E. a. australis* (Shaw, 1790) – E Queensland (along W side of Great Dividing Range), E half of New South Wales (except NE corner), SE South Australia and S & E Victoria.



**Descriptive notes.** 13.5–17 cm; male 18–28 g, female 15–24 g. Nominant race has head and neck grey, very faint off-white supercilium, lores sooty black, ear-coverts faintly streaked white; mantle, back and scapulars grey with dark olive tinge, rump and uppertail-coverts olive; upperwing mostly grey-brown, wing-coverts grey, inner primaries and secondaries with pale bases (not visible on folded wing, but forming wingstripe in flight); tail grey-brown, outer rectrices with narrow pale tips when plumage fresh; chin off-white, throat and underparts yellow, flanks tinged olive; iris dark brown; bill black; legs blackish-brown. Sexes similar. Ju-

venile is rufous-brown with pale streaks; immature similar to adult, but secondary coverts have pale shaft streaks. Race *chrysorhchos* differs from nominate mainly in having rump and uppertail-coverts bright yellow, like underparts. Voice. Song consists of repeated, evenly pitched piping notes. Call a loud whistled “tchop tchop”; grating “chet chet chet chet” as scold or alarm.

**Habitat.** Rainforest, wet and dry eucalypt (*Eucalyptus*) forest and woodland, riparian scrub, mallee, *Acacia-Callitris* shrubland, gardens, parks, exotic pine (*Pinus*) plantations; favours areas with tall shrub layer, sparse ground cover and usually medium to dense understorey.

**Food and Feeding.** Insects, spiders (Araneae) and other small arthropods. Takes prey mainly from ground, scanning and pouncing from low perch (usually 1–5 m), or by gleaning among fallen vegetation. In various studies, initial perch height 0–1 m (30–73% of observations), 1–2 m (7–23%), 2–5 m (6–38%) or above 5 m (8–11%), and prey seized on ground (66–80%), from bark (9–19%) and foliage (3–9%) or in air (5–11%). Most attacks on prey made by pouncing (36–75%); may also feed while on ground. Gleans from foliage and bark (3–22%), makes aerial sallies (5–12%) and captures items in sally-strikes (7–14%) to lesser extent, 0.6–3.2 attacks per minute. Occasionally joins mixed-species foraging flocks; also follows foraging Superb Lyrebird (*Menura novaeollandiae*) to snatch insects disturbed by it.

**Breeding.** Season Jul–Jan, occasionally as early as Jun; up to 3 broods. Monogamous; c. 25% of pairs have one or two (possibly more) helpers, male and helpers feed female. Territory occupied throughout year, usually for consecutive years, but not always defended in non-breeding season. Nest built by female, new one for each brood, work taking 10–15 days for first nest and 8–10 days for subsequent ones, a cup made of bark strips, fine twigs, grass, leaves and other vegetation, bound with spider web on outside, to which lichen and bark chips attached, lined with rootlets, grass and bark, external diameter 6–10 cm, height 5–9 cm, internal diameter 5–7 cm, depth 3–4 cm; placed up to 25 m from ground, usually at 1–6 m (mean c. 2.5 m), usually in vertical or horizontal fork in shrub or tree, occasionally in vines or tree-fern; territory size 0.8–2 ha. Clutch 2 eggs, sometimes 1 or 3, rarely 4, light blue-green, with reddish-brown speckles and spots either evenly distributed or concentrated towards larger end, average 22.7 × 16.4 mm; laying starts 2–3 days after nest completion; incubation by female, spending up to 80% of daylight hours on nest in bouts of 1–98 minutes, incubation period 15–17 days; chicks brooded by female, fed by both parents and by any helpers present, nestling period 10–14 days; adults perform broken-wing display if nest approached; fledglings fed by all adults until start of next clutch, median 21 days. Nests parasitized by Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*). Hatching success c. 60%, fledging success 28–39%; avian predators include Pied Currawong (*Strepera graculina*), Grey Butcherbird (*Cracticus torquatus*), Australian Magpie (*Gymnorhina tibicen*), Laughing Kookaburra (*Dacelo novaeguineae*) and Australian Raven (*Corvus coronoides*). Greatest recorded longevity 12 years 10 months.

**Movements.** Generally considered sedentary, although evidence of some seasonal movements, the nature of which is not well understood (not attributed to juvenile dispersal). Some seasonal shifts to lower elevations recorded in SE highlands; reporting rates above 500 m c. 26% in spring–summer months and c. 13% in autumn–winter. Of more than 200 marked juveniles and 75 adults, 99.9% of recoveries were made less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Common. Has probably extended its range N along The Coorong (SE South Australia) in recent years.

**Bibliography.** Barrett *et al.* (2003), Berry & Lill (2003), Boles (1988), Chisholm (1960), Cooper (1969b), David & Gosselin (2002a), Debus (2006a, 2006b, 2006c), Debus *et al.* (2004), Ford (1979a), Ford *et al.* (1986), Galbraith (1974a), Haylock & Lill (1988), Higgins & Peter (2002), Keast (1958b, 1961, 1985, 1994c), Lane (1976), Le Souëf (1909), Littlejohns (1932), Marchant (1980, 1982, 1984a, 1985a, 1987), Mathews (1920c), Miller & Staley (1994), Officer (1969), Recher & Holmes (1985), Recher *et al.* (1985), Schodde & Mason (1999), Shields & Recher (1984), Wolstenholme (1929), Zanette (2000, 2001), Zanette *et al.* (2000).

## 17. Western Yellow Robin

### *Eopsaltria griseogularis*

**French:** Miro à poitrine grise **German:** Graumantelschnäpper **Spanish:** Petroica Pechigris  
**Other common names:** Grey-breasted Robin/Shrike-robin

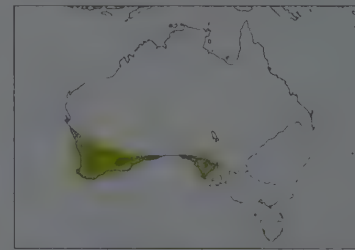
**Taxonomy.** *Eopsaltria griseogularis* Gould, 1838, Swan River, Western Australia, Australia.

Closely related to, and sometimes treated as conspecific with, *E. australis*. Two subspecies recognized.

**Subspecies and Distribution.**

*E. g. griseogularis* Gould, 1838 – extreme SW corner of Western Australia (Darling Range and R Swan coastal plain), in extreme SW Australia.

*E. g. rosinae* (Mathews, 1912) – SW & S Western Australia (except for extreme corner) and S South Australia (mainly Eyre Peninsula).



**Descriptive notes.** 13.5–15.5 cm; 18.5–21.5 g. Nominant race has grey head and neck, black lores, ill-defined pale grey supercilium from base of bill to rear of ear-coverts, diffuse sooty-grey line from gape to eye; mantle, scapulars and back grey to olive-grey, rump bright yellow or yellow-olive; upperwing grey-brown, white patch near base of primaries and inner secondaries (obscured on folded wing, visible as wingstripe in flight); tail grey-brown, all rectrices except central pair with fine white tips; chin and throat white, breast light grey, belly and undertail-coverts yellow; iris dark brown; bill black; legs blackish-brown. Sexes similar.

Juvenile is rufous-brown with pale shaft streaks; immature similar to adult, except that secondary coverts are light brown with pale shaft streaks. Race *rosinae* differs from nominate in having back darker, rump olive-green, belly with reduced yellow. Voice. Song of 2 staccato piping notes followed by series of drawn-out whistles. Contact call a whistled “tchair tchair”; alarm call an explosive “churr churr”.

**Habitat.** Open eucalypt (*Eucalyptus*) forest and woodland, mallee and other lightly timbered scrub with moderately dense understorey.

**Food and Feeding.** Mainly insects, also some other small arthropods and seeds. Feeds mostly on ground (83–96% of observations), most of remainder on trunks of trees to 1.5 m, and no observation above 5 m, occasionally in sarums and on dead logs. During winter months spends more time on ground, forages lower, uses lower perches. Majority of prey obtained by pouncing to ground from elevated perch 2.4 m (0.1–8 m) up, this accounting for 65–67% of attacks; occasionally gleans (8–20%) or seizes items in aerial sallies (less than 15%) or in sally-strikes (3%). Joins mixed-species foraging flocks.



**Breeding.** Season Jul to early Jan, mostly Sept–Nov; one or two broods. Breeds as pair, often with one or two helpers. Territorial throughout year. Nest built by female, an open cup of bark, grass, twigs and dried leaves, bound with spider web, bark strips hanging vertically from rim along outside, lined with grass and dry leaves, external diameter 5–7 cm, height 7–9 cm, internal depth 3–5 cm; placed 0.5–2.2 m (usually c. 3 m) from ground in vertical fork or occasionally on reclining branch of sapling, shrub or tree; territory 2–3 ha during breeding season. Clutch 2 eggs, occasionally 3, pearly grey to grey-green, overlay of reddish markings often concentrated towards large end or around middle, average size 20.9 × 15.5 mm; incubation by female, fed by breeding male and by any helpers present, period 15 days; chicks fed by both parents and by helpers, no information on duration of nestling period; distraction displays given by adults towards perceived threats to nest; fledglings fed by both parents, brood divided between them if two or more young, helpers also feed fledglings. Hatching success 0–60%; nest predation by Grey Shrike-thrush (*Colluricincla harmonica*) reported. Greatest recorded longevity more than 8 years 11 months.

**Movements.** Sedentary; possibly some local movements. Almost all recaptures of marked individuals were made less than 10 km from site of original ringing; at one locality, 50% of individuals ringed were recaptured at same place.

**Status and Conservation.** Not globally threatened. Common. In W, range around Perth and Darling Ranges has contracted since c. 1930 owing to loss of habitat for wheat-growing; this species continues to disappear from remaining fragments of woodland and forest.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Brown & Brown (1980), Calver & Wooller (1981), Campbell (1901), Carter (1924a), Condon (1951), Cousin (2004a, 2004b), Craig (2002), Ford (1963, 1971b, 1979a), Galbraith (1974a), Garnett & Crowley (2000), Higgins & Peter (2002), Johnstone & Storr (2004), Keast (1958b, 1961), Mathews (1920e), North (1903), Officer (1969), Recher & Davis (1998), Recher *et al.* (2002), Saunders & Curry (1990), Saunders & Ingram (1995), Schodde & Mason (1999), Serventy & Whittell (1976), Waterman (1966).

## 18. Yellow-bellied Robin

### *Eopsaltria flaviventris*

**French:** Miro à ventre jaune **German:** Gelbbauchschnäpper **Spanish:** Petroica Ventrigualda  
**Other common names:** New Caledonian Yellow Robin

**Taxonomy.** *Eopsaltria flaviventris* Sharpe, 1903, New Caledonia. Monotypic.

**Distribution.** New Caledonia.



**Descriptive notes.** 14–15 cm; 10.5–14.5 g. Has pale grey lores, light grey face, ear-coverts and side of neck; crown and upperparts, including upperwing-coverts, dark brownish-olive, rump slightly paler; flight-feathers and tail dark brown, remiges thinly edged with olive; centre of throat and upper breast very pale grey, central breast light grey, lower breast and side of upper belly grey, breast sometimes with paler whitish streaking, remainder of underparts bright lemon-yellow; iris dark brown, upper mandible dusky, lower mandible yellowish; feet pale pinkish-brown. Sexes alike. Juvenile is brownish with indistinct paler shaft

streaks, particularly on crown. **VOICE.** Song is a repeated short warble with phrases of rapid short peeps combined with many liquid notes; high-pitched “tsip-tsip” sometimes uttered between phrases. Also regular series of “chip-chip-chip” notes, and a harsh alarm call.

**Habitat.** Dry lowland woods, pine–pandanus (*Pinus–Pandanus*) forest, and humid forest. From sea-level up to c. 1050 m; up to 1525 m on Mt Panie.

**Food and Feeding.** Insects. Forages below 3 m. Prey usually captured on the ground, occasionally in low bushes. Drops onto prey in the leaf litter.

**Breeding.** Season Sept–Mar; probably double-brooded. Nest a cup of grass and other thin vegetation, bound externally with spider web and decorated with pieces of bark and lichen, external diameter 4.5 cm, placed 1–5 m from ground on slender branch. Clutch 2 eggs, light bluish-grey, heavily marked with dark brown splotches; both parents incubate eggs and care for young, no information on duration of incubation and nestling periods; performs injury-feigning distraction display.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in New Caledonia EBA. Reported to be fairly common, at any rate in parts of range. Present in Rivière Bleue Reserve.

**Bibliography.** Barré & Dutson (2000), Brasil (1916), Cracraft (1986), Dutson (2007a), Hannecart & Létocart (1980a), Layard & Layard (1878a, 1882), Ross (1988), Sarasin (1913), Warner (1947).

## Genus *PENEOENANTHE* Mathews, 1920

### 19. Mangrove Robin

#### *Peneoenanthe pulverulenta*

**French:** Miro des mangroves **German:** Mangroveschnäpper **Spanish:** Petroica de Manglar  
**Other common names:** Ashy Robin(1), White-tailed Robin, Mangrove/White-tailed Shrike-robin; New Guinea Mangrove Robin (*pulverulenta*); Australian Mangrove Robin (Australian races)

**Taxonomy.** *Myiolestes pulverulentus* Bonaparte, 1850, Utanata River, southern New Guinea. This has been placed in genus *Peneoenanthe*, and more recently in *Eopsaltria*; *repenana* is its own monotypic genus probably preferable, as closest relationships of this species to others in subfamily Eopsaltriinae uncertain. Four subspecies recognized.

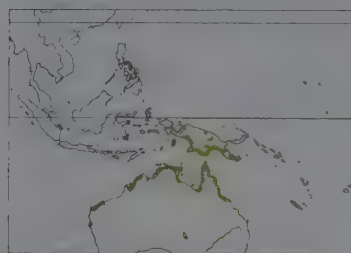
**Subspecies and Distribution.**

*P. p. pulverulenta* (Bonaparte, 1850) – coastal districts and middle R Sepik and middle R Fly, in New Guinea.

*P. p. leucura* (Gould, 1869) – Aru Is. and N Australia (coastal N Queensland).

*P. p. alligator* (Mathews, 1912) – coast of Northern Territory, in N Australia.

*P. p. cinereiceps* (E. J. O. Hartert, 1905) – coastal NW & NE Western Australia.



**Descriptive notes.** 14–15 cm; 18–24 g. Nominative race has lores black, ear-coverts dark smoky grey; crown to rump dark smoky grey, uppertail-coverts black; upperwing brownish-black, small diffuse white spot near bases of inner primaries and secondaries (not visible on folded wing, forming inconspicuous stripe in flight); tail black-brown, all except central rectrices with white bases (about basal half white on outer four pairs); chin, cheek and throat white, breast to flanks with greyish wash, belly and undertail-coverts white; iris dark brown; bill black; legs black or dark grey. Sexes alike. Juvenile has head and upperparts

dark brown with pale shaft streaks, upperwing-coverts tipped dark buff, underparts off-white with brown feather tips, bill horn-brown; immature similar to adult, but has pale edges on wing-coverts and secondaries. Race *leucura* has head and neck much lighter and greyer than nominate, not contrasting with back, breast strongly washed grey; *cinereiceps* is similar to previous, but upperparts browner; *alligator* has crown, neck and ear-coverts much blacker, contrasting with upperparts, pale grey wash on breast. **VOICE.** Song consists of 1–3 beautiful, fairly plaintive, low-pitched descending notes, “pyu” or “pypyu”; other vocalizations include musical warbling, harsh “chack” and soft chirring.

**Habitat.** Coastal and near-coastal mangroves; in New Guinea, also enters subcoastal paperbark (*Melaleuca*) swamps and riverside reedbeds mixed with shrubs farther inland. Only at or near sea-level.

**Food and Feeding.** Insects, crustaceans and other small invertebrates. Frequents middle storey and understorey. Feeds mainly on the ground, pouncing on prey from an elevated perch.

**Breeding.** In New Guinea, eggs in late Sept and young in mid-Feb, late May and mid-Jul, indicating breeding during both wet and dry seasons; breeds mainly Sept–Feb in Australia; one or several broods per season. Nest built by female, a compact cup of bark and dry vegetation, bound with spider web, decorated externally with vertically hanging bark strips, lined with rootlets, grass and other fine vegetation, external diameter 6.4–7.6 cm, height 3.5–7.1 cm, internal diameter 5.3–5.8 cm, depth 2–2.8 cm; placed 1–4.5 m up in fork in mangrove or against trunk at base of branch. Clutch 2 eggs, occasionally 3, olive-green or light yellowish-green, with dull reddish-brown markings around larger end, average size 20.1 × 15.6 mm; female incubates eggs, both sexes feed and care for young, no information on duration of incubation and nestling periods.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common. Widely distributed around New Guinea coast, but reported to be local and patchy in N. Locally common in N Australia. This species’ apparent dependence on mangrove habitat could render it vulnerable in the future.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Campbell & Barnard (1917), Clapp (1980), Coates (1990), Finch (1982a), Ford (1983b), Galbraith (1974a), Hall (1902), Higgins & Peter (2002), Hill (1911), Iredale (1956), Johnstone (1990), Johnstone & Storr (2004), Keast (1958b), Macgillivray (1914), Marshall (1933), Mathews (1920e), Mayr (1941a), Mees (1982), North (1903), Noske (1996), Officer (1969), Rand (1942a), Salvadori (1881), Schodde & Mason (1999), Serventy & Whittell (1976), White (1910).

## Genus *PNEOTHELLO* Mathews, 1920

### 20. Slaty Robin

#### *Pneothello cyanus*

**French:** Miro gris-bleu **German:** Graubauch-Dickichtschnäpper **Spanish:** Petroica Azulada  
**Other common names:** Blue-grey Robin, Slaty Robin-flycatcher/Thicket-flycatcher, Blue Flycatcher-robin

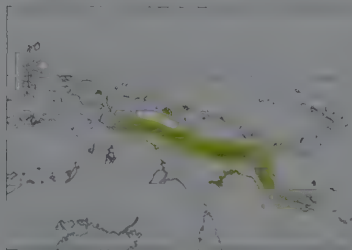
**Taxonomy.** *Myiolestes? cyanus* Salvadori, 1874, Arfak Mountains, New Guinea. Forms a species pair with *P. cryptoleuca*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. c. cyanus* (Salvadori, 1874) – Vogelkop (Arfak Mts), in NW New Guinea.

*P. c. atricapilla* (E. J. O. Hartert & Paludan, 1934) – C & N New Guinea mountains E to Hindenburg Range.

*P. c. subcynaea* (De Vis, 1897) – mountains of E & SE New Guinea, including Adelbert Mts and Huon Peninsula.



**Descriptive notes.** 14–15 cm; 24–30 g. Nominative race has head and body blue-grey, side of face somewhat darker, underparts slighly paler; wing and tail blackish; iris dark brown; bill and legs black. Sexes alike. Juvenile has body feathers and wing-coverts slate with buff shaft streaks and large rusty-brown tips; immature retains juvenile wing-coverts. Race *atricapilla* is darker than nominate, with crown blacker; *subcynaea* has crown lighter. **VOICE.** Song 12 musical whistles starting on same pitch, then progressively rising and accelerating. Calls include loud, unmusical 3-note phrase repeated without pause several times

and preceded by 1–2 other notes, also loud rapid series of “teeder-teeder-teeder-teeder-teeder”, first note of each pair higher in pitch than second.

**Habitat.** Forest and adjoining secondary growth at c. 900–2750 m, mainly 1500–2500 m; upper level that at which heavy moss cover appears. Where co-occurs with *P. c. atricapilla*, the two have mutually exclusive altitudinal ranges, present species occupying lower levels. Transition at 1415 m (Gauttier Mts) to 2400 m (Weyland Mts).

**Food and Feeding.** Insects, including ants (Hymenoptera), weevils and other small beetles (Coleoptera) and flynnid wasps. Frequents subnive and ground, occasionally ascending to 5 m. Food items obtained by sally-striking (c. 75% of observations) and gleaning (c. 25%) in undergrowth (c. 60%) and on ground (c. 35%).



**Breeding.** Season on Mt Missim (SE of range) reported as Nov–Dec; elsewhere, nests with egg or young in late Sept, mid-Oct and late Dec to early Jan, adult feeding young in mid-Mar and fledgling in early Apr, nests in late Apr, and males with enlarged gonads in Jun and Aug–Sept, records suggesting that season extends from late dry season to late wet season, at least. Nest a deep, bulky cup made from fine rootlets, covered on outside with thick layer of green moss, lined with dried fern fronds; placed up to 6 m from ground in upright fork of slender sapling or low bush, or in fork of sapling branch, usually in open situation. Clutch 1 egg, possibly 2 on occasion. Light olive to olive-green, sometimes with reddish tinge or with olive-brown to reddish-brown markings (often forming zone around larger end), size 20.5 × 17–19 mm; no information on incubation and nestling periods.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common in some regions of range; otherwise scarce or absent. In study at 1580–2100 m on Mt Karimui, in E New Guinea, this was the commonest petroicid and the fourth most abundant bird species within this altitudinal zone.

**Bibliography.** Anon. (1986), Beehler (1978b), Coates (1990), Croxall (1977), David & Gosselin (2002b), Diamond (1972), Finch (1981a), Gilliard & LeCroy (1961b), Greenway (1935), Gyldenstolpe (1955a), Harrison (1971), Hoogerwerf (1971), Iredale (1956), Mayr (1941a), Rand & Gilliard (1967), Salvadori (1881), Sims (1956).

## 21. Smoky Robin

### *Peneothello cryptoleuca*

**French:** Miro ombré **German:** Fahlbauch-Dickichtschnäpper **Spanish:** Petroica Sombria  
**Other common names:** Grey Robin/Thicket-flycatcher

**Taxonomy.** *Poecilodryas cryptoleucus* E. J. O. Hartert, 1930, Lehuma, Arfak Mountains, New Guinea. Forms a species pair with *P. cyanus*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. c. cryptoleuca* (E. J. O. Hartert, 1930) – Vogelkop (Tamarau Mts, Arfak Mts), in NW New Guinea.  
*P. c. maxima* Diamond, 1985 – Kumawa Mts, in S Bomberai Peninsula (W New Guinea).

*P. c. albidior* (Rothschild, 1931) – Weyland Mts, Gauttier Mts and Nassau Mts, in WC New Guinea.



**Descriptive notes.** 14–5 cm; 18–20 g. Nominate race has crown blue-grey, upperparts sooty grey, upperwing and tail black, underparts pale slate-grey; undersurface of base of inner primaries white (forming small patch on underwing), axillaries blue-grey; iris dark brown; bill and legs black. Sexes alike. Juvenile undescribed. Race *albidior* has belly paler, more greyish-white, than nominate; *maxima* is larger, has underparts entirely whitish, axillaries grey and white. **VOICE.** Song an ascending, decelerating whistled trill. Call “chip”, singly or repeated.

**Habitat.** Mountain forest, thickets and forest edge, at 1400–2500 m. Where co-occurs with *P. cyanus*, the two have mutually exclusive altitudinal ranges, present species occupying higher levels; transition at 1415 m (Gauttier Mts) to 2400 m (Weyland Mts).

**Food and Feeding.** Insects. Forages in forest undergrowth from near ground to 5 m up.

**Breeding.** Adults with juveniles observed in Jan–Feb. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in West Papuan Highlands EBA and Central Papuan Mountains EBA. Status uncertain; poorly known species.

**Bibliography.** David & Gosselin (2002b), Diamond (1985), Gilliard & LeCroy (1961b), Hartert (1930), Mayr (1941a), Rothschild (1931), Stein (1936).

## 22. White-rumped Robin

### *Peneothello bimaculata*

**French:** Miro à croupion blanc **Spanish:** Petroica Culiblanca  
**German:** Weißbüßel-Dickichtschnäpper  
**Other common names:** White-rumped Thicket-flycatcher, White-spotted Flycatcher-robin

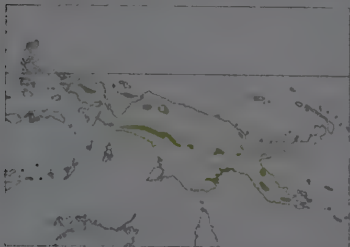
**Taxonomy.** *Myiolestes? bimaculatus* Salvadori, 1874, Putat, Arfak Mountains, New Guinea.

Two subspecies recognized.

**Subspecies and Distribution.**

*P. b. bimaculata* (Salvadori, 1874) – Yapen I, Gauttier and Van Rees Mts, and S slopes of mountains of W, C & SE New Guinea.

*P. b. vicaria* (De Vis, 1892) – Adelbert Mts, mountains of Huon Peninsula and N watershed of SE New Guinea (E to Mt Suckling and Mt Dayman).



**Descriptive notes.** 13–14 cm; 20–27 g. **Male** nominate race is black, except for white uppertail-coverts, white band from side of lower throat to side of upper breast and white belly; iris dark brown; bill and legs black. Female is similar to male, but black areas tinged brown. Immature is sooty black, with some upperwing-coverts washed brownish, some underwing-coverts tipped white. Race *vicaria* differs from nominate in having belly black. **VOICE.** Song 4–6 short whistled, bell-like notes preceded by shorter, fainter, higher-pitched note.

**Habitat.** Rainforest, mainly in hills and lower mountains, at 200–1700 m, perhaps higher, usually 700–1100 m; width of altitudinal zone within which it is found varies from one location to another (100–700 m), but usually narrow. Replaced at higher elevations by *P. cyanus*.

**Food and Feeding.** Insects and larvae, possibly also small earthworms. Frequents substage of forest. Food items obtained by making sally strikes (c. 80% of observed attacks) and by gleaning (c. 20%), mainly on ground (c. 70%).

**Breeding.** Adult males with enlarged gonads in Jul–Aug. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Generally scarce, but locally common. Not well known.

**Bibliography.** Beehler (1978b, 1980), Coates (1990), Croxall (1977), David & Gosselin (2002b), Diamond (1972, 1985), Finch (1981b), Iredale (1956), Mayr (1941a), Salvadori (1881).

## 23. White-winged Robin

### *Peneothello sigillata*

**French:** Miro à ailes blanches **German:** Spiegeldickichtschnäpper **Spanish:** Petroica Aliblanca  
**Other common names:** White-winged Flyrobin/Thicket-robin/Thicket-flycatcher, Black Flycatcher-robin

**Taxonomy.** *Poecilodryas? sigillata* De Vis, 1890, Mount Victoria, south-east New Guinea.

Four subspecies recognized.

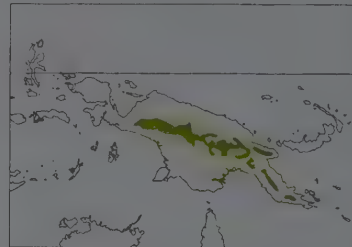
**Subspecies and Distribution.**

*P. s. quadrimaculata* (van Oort, 1910) – Nassau Mts and Oranje Mts, in WC New Guinea.

*P. s. hagenensis* Mayr & Gilliard, 1952 – C New Guinea mountains (from Mt Antares E to Mt Hagen).

*P. s. sigillata* (De Vis, 1890) – C ranges in E & SE New Guinea (E from Schrader Mts, Bismarck Range and Kubor Range).

*P. s. saruwagedi* (Mayr, 1931) – mountains of Huon Peninsula, in NE New Guinea.



**Descriptive notes.** 14–15 cm; 21–28 g. Nominate race has head, body and tail velvety black; remiges brownish-black, tertials white with black tips (forming patch), median and lesser upperwing-coverts black; iris dark brown; bill and legs black. Sexes similar. Juvenile is dark brown, paler on underparts, with pale buff, olive-brown or rufous shaft streaks on body feathers and upperwing-coverts; immature retains some juvenile wing-coverts. Race *saruwagedi* is smaller than nominate, with black tips of tertials more extensive; *hagenensis* lacks black tips on tertials; *quadrimaculata* also lacks black tertial tips, and has white patch

on each side of breast. **VOICE.** Song described as a slow trill of piping notes, sometimes rising and sometimes falling gradually in pitch. Calls include rapid high-pitched descending trill, sharp alarm note, and thin metallic notes given during chases.

**Habitat.** Moss forest and adjacent shrubbery at 2400–3900 m, extending down to 2150 m in places. Replaced at lower elevations by *P. cyanus*.

**Food and Feeding.** Insects; occasionally fruit and seeds. Frequents substage of forest. Forages by sally-striking (c. 80% of observed attacks) and gleaning (c. 20%) in undergrowth (c. 40%) and on ground (c. 60%).

**Breeding.** Nest with chicks in late Sept, nest with egg and chick in late Oct, adult at empty nest in mid-Oct and dependent fledgling in late Jan, indicating breeding during late dry season to beginning of wet season, at least. Nest a large bulky structure of loose green moss and rootlets, lined with dried filmy fern and thin stems, placed in fork. Clutch 1 egg, possibly sometimes 2, light olive, sparsely marked all over with brown and dark brown, and with cap of brown on larger end; no information on incubation and nestling periods.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Generally common.

**Bibliography.** Beehler (1978b), Bell (1971), Coates (1990), Croxall (1977), David & Gosselin (2002b), Diamond (1972, 1985), Gilliard & LeCroy (1961b), Gyldenstolpe (1955a), Iredale (1956), Mayr (1931b, 1941a), Mayr & Rand (1937), Rand (1942b), Rand & Gilliard (1967), Sims (1956).

## Genus *MELANODRYAS* Gould, 1865

## 24. Hooded Robin

### *Melanodryas cucullata*

**French:** Miro à capuchon **German:** Schwarzkopfschnäpper **Spanish:** Petroica Encapuchada  
**Other common names:** Hooded Robin-flycatcher, Pied/Black(!)/Black-and-white Robin

**Taxonomy.** *Muscicapa cucullata* Latham, 1801, Sydney, New South Wales, Australia.

Has often been placed in genus *Petroica*, but differs in plumage details (no frontal spot, no red in plumage) and body postures, and also has juvenile plumage, nest and eggs, and skull characters unlike those of that genus but similar to those of some other eopsaltrine species. Mainland races intergrade over broad areas. Four subspecies recognized.

**Subspecies and Distribution.**

*M. c. melvilleensis* (Zietz, 1914) – Tiwi Is (Melville I, Bathurst I), off Northern Territory, in N Australia.

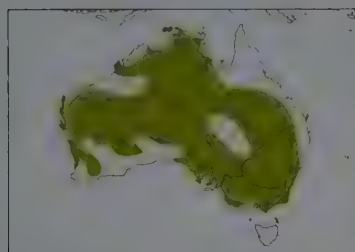
*M. c. picata* Gould, 1865 – N & E Australia from N Western Australia (Kimberley) and N half of Northern Territory E to C & S Queensland, S to C New South Wales.

*M. c. westralensis* (Mathews, 1912) – S two-thirds of Western Australia, SW quarter of Northern Territory and W two-thirds of South Australia (including Eyre Peninsula, to head of Spencer Gulf).

*M. c. cucullata* (Latham, 1801) – SE Australia from SE Queensland (along W side of Great Dividing Range) S to SE South Australia and Victoria.

**Descriptive notes.** 15–17.5 cm; 21–28 g. Male nominate race has head and upperparts black, outer scapulars white, upperwing black, white bar across bases of remiges (except primaries P9 and P10 and outer secondaries), white fringe at tips and distal outer web on secondaries, inner primaries and outermost tertial and white edges of marginal coverts (form white central and trailing bars on folded wing, and prominent stripe in flight); tail black, central pair of rectrices entirely so, adjacent pair with basal three-quarters of outer web white, outer four pairs with basal two-thirds white and narrow white tip; chin, throat and centre of upper breast black, remainder of underparts white; iris dark brown; bill and legs black. Female has crown to neck side and upperparts brownish-grey, fine white supercilium above diffuse black eyestripe from lores to ear-coverts, dark brownish-grey face, ear-coverts finely streaked white, wing and tail as male but black replaced by dark brown;





chin and throat pale grey, upper breast grey, grading to white on remainder of underparts. Juvenile is dark grey-brown with buff streaks above, wing and tail as female, off-white underparts mottled and streaked with buff and dark grey-brown; immature similar to female, but retains juvenile's streaked secondary coverts. Race *westralensis* is slightly smaller than nominate, bill proportionately longer, female with brownish wash on upperparts and throat, faint grey mottling on breast, white on tips of rectrices reduced; *picata* is similar but smaller-bodied, with relatively medium-length bill, white tail tips larger; *melvillensis* is very small-

bodied, with proportionately long bill, male belly area lightly washed with grey, female upperparts washed with brown. VOICE. Song a clear whistling "whee-whee whee-whee whee-whee" (early morning) or "wheetyer-cantyer-cantyer-wheetyer" (at night, particularly if well moonlit). Calls include 2–3 notes as contact, also monotonous piping "phew", high-pitched metallic "squee", harsh scolding.

**Habitat.** Lightly timbered woodland and shrubland dominated by eucalypts (*Eucalyptus*) and acacias (*Acacia*), such as mallee, mulga and mixed open woodland, in semi-arid and arid zone into temperate regions; often found near clearings.

**Food and Feeding.** Insects and other small arthropods; occasionally seeds. Feeds mostly on ground, often pouncing on prey from low perch. More time spent on or near ground in winter. Extensive study (more than 17,000 records) at several sites on New England Tableland, in New South Wales, produced the following figures for seasonal use of different perch heights: in spring 0–1 m (26–39% of recorded observations), 1–2 m (12–16%), 2–5 m (19–39%), 5–8 m (13–22%) and above 8 m (2–10%); in summer 0–1 m (16–23%), 1–2 m (16–29%), 2–5 m (14–39%), 5–8 m (13–28%) and above 8 m (8–19%); in autumn 0–1 m (26–32%), 1–2 m (15–24%), 2–5 m (29–35%), 5–8 m (9–23%) and above 8 m (3–6%); in winter 0–1 m (36–66%), 1–2 m (15–20%), 2–5 m (13–29%), 5–8 m (4–14%) and above 8 m (1–6%). Branches are main perch throughout year, although use of other low sites increases in winter months; branch used in 65–77% of observations in spring, 70–90% in summer, 64–77% in autumn and 48–69% in winter; trunks, logs, stumps, objects on ground and man-made objects make up remainder of sites. Most prey captured on ground, with little seasonal change in proportion of pouncing (39–63%); more pronounced seasonal variation in time spent in ground-gleaning, i.e. 18–41% in spring, 13–32% in summer, 30–34% in autumn, 40–50% in winter. Gleaning from bark varies from 16–18% in summer to 4–8% in winter; likewise, amount of aerial flycatching varies from summer (8–14%) to winter (2–4%). May join mixed-species foraging flocks in winter months. Defends non-breeding territory of sometimes 30–50 ha.

**Breeding.** Eggs early Aug to late Dec, possibly to mid-Jan; possibly double-brooded, but will lay up to five replacement clutches in a season. Breeds as monogamous pairs, about a third of which have one or two helpers. Territorial throughout year, territory defended by both parents and helpers. Nest built by female, a cup of bark, grass, twigs and rootlets, bound externally with spider web, with bark and lichen often attached to outside, lined with fine grass, rootlets, hair and feathers, external diameter 7–9.5 cm, height 3.8–6.5 cm, internal diameter 5–6.4 cm, depth 2.5–3.5 cm; placed 0.1–1.8 m (usually c. 1.6 m) from ground in horizontal fork on tree branch, occasionally in hollow in stump or outgrowth in dense shrub; breeding territory c. 6 ha. Clutch 2–3 eggs, occasionally 1, rarely 4, very pale olive to apple-green with dark brown suffusion, particularly at larger end, or green-olive, average 20.6 × 15.3 mm; laying starts 1–10 days after nest completed; incubation by female (occasionally assisted by male) and chicks brooded by female, fed by male during both stages, nestlings and fledglings fed by both parents and by any helpers present; adults perform injury-feigning distraction display towards intruders near nest; incubation period 14–16 days, nestling period 12–14 days; young fed for up to 4 weeks after leaving nest. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Hatching success 40–65%, fledging success 20–47%; known avian nest predators include Grey Currawong (*Strepera versicolor*) and Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*). May breed in immature plumage. Greatest recorded longevity 9 years 7 months.

**Movements.** Generally sedentary, with some local movements; no evidence of large-scale population shifts, although described as non-breeding visitor in parts of its range. Almost all recoveries of marked birds less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. Nominat race has undergone marked reduction in numbers and range in SE Australia owing to habitat clearance for agriculture; remaining habitat is often fragmented. For reasons that are unclear, this species responds poorly to fragmentation, and even large habitat remnants seem unable to support viable populations. This suggests that clearance activities on Tiwi is may have similar effects on the small population there (race *melvillensis*). Nominat race is considered "Near-threatened" in Australia; occurs in Wyperfeld National Park, in NW Victoria. Race *melvillensis* is considered "Vulnerable".

**Bibliography.** Barrett *et al.* (2003), Bell (1984d), Boles (1988), Brooker & Saffer (1996), Campbell (1901), Chisholm (1960), Courtney & Marchant (1971), Faithfull (1991), Fitri & Ford (1997, 1998, 2003a, 2003b), Galbraith (1974a), Garnett & Crowley (2000), Graham, B. (1990, 1993), Graham, W.S. (1995), Higgins & Peter (2002), Johnstone & Storr (2004), Keast (1958b), Leach (1929), Maron & Lill (2005), Mees (1961), North (1903), Officer (1969), Recher & Davis (1997, 1998), Recher *et al.* (2002), Reid (1999), Robinson & Traill (1996), Rogan (1964), Schodde & Mason (1999), Sullivan (1993), Traill & Duncan (2000).

## 25. Dusky Robin

*Melanodryas vittata*

**French:** Miro de Tasmanie **German:** Tasmanschnäpper **Spanish:** Petroica de Tasmania  
**Other common names:** Dusky Robin-flycatcher, Sleepy/Stump/Tasmanian/Wood Robin

**Taxonomy.** *Muscicapa vittata* Quoy & Gaimard, 1830, Tasmania, Australia. Has often been placed in genus *Petroica*, but differs in plumage details (no frontal spot, no red in plumage) and body postures, and also has juvenile plumage, nest and eggs, and skull characters unlike those of that genus but similar to those of some other eopsaltrine species. Usually regarded as Tasmanian vicariant of mainland *M. cucullata*. Two subspecies recognized.

**Subspecies and Distribution.**

*M. v. kingi* (Mathews, 1914) – King I., in W Bass Strait (between Tasmania and mainland Australia).  
*M. v. vittata* (Quoy & Gaimard, 1830) – Flinders I. (in E Bass Strait) and Tasmania.

**Descriptive notes.** 16–16.5 cm; 25–31 g. Nominat race has crown to neck side and hindneck dark brown, creamy supercilium from base of bill to rear of ear-coverts, narrow dark brown eyestripe, brown ear-coverts with light cream streaks; upperparts brown; upperwing dark brown, faint pale



line across bases of most primaries and secondaries and small whitish patch at bend of wing; tail dark brown, rectrices with paler edging and tips; chin and throat light grey-brown, underparts light brown, greyish wash on breast side; iris dark brown; bill black; legs very dark grey. Sexes alike. Juvenile has brown upperparts with pale shaft streaks, pale brown underparts mottled and streaked buff and dark brown; immature similar to adult, but retaining juvenile's streaked secondary coverts. Race *kingi* is somewhat warmer brown on body, wings and tail than nominate. VOICE. Song is a far-carrying whistle, "cho-wee, choo-wee";

call consists of low mournful notes.

**Habitat.** Drier eucalypt (*Eucalyptus*) woodland. Favours ecotones, particularly forest margins, coastal heath, sedge-land, woodlots, farmlands, gardens, orchards, recently burnt areas; avoids dense forest. Sea-level to 1200 m.

**Food and Feeding.** Invertebrates, particularly insects; some seeds. Feeds on the ground, pouncing on prey from elevated perch such as fence post; occasionally forages among foliage or in air. Proportion of foraging methods and substrates varies seasonally in some areas: in winter, pouncing 86% of attacks; in summer, pouncing 24%, sally-strikes to foliage or other substrate 24%, and probing/gleaning from trunks 26%.

**Breeding.** Season late Jul to late Dec; double-brooded. Helpers, often young of earlier broods, may assist at nest. Territorial when breeding. Nest built by female, an untidy cup of dried vegetation, including grass, bark strips and rootlets, bound externally with spider web, lined with grass, plant fibre, rootlets and fur, external diameter c. 10 cm, height 5.1–7 cm, internal diameter 6.4 cm, depth 3.8–4.4 cm; placed from almost ground level to 5 m (usually at c. 1.5 m) in fork, crevice or cavity. Clutch 2–4 eggs, usually 3, greenish-blue to olive-green, washed light fawn or muddy brown, some with reddish-brown blotches or smudges, average 22.3 × 16.8 mm; incubation by female, sitting for up to 85% of daytime, period 16–18 days; chicks brooded by female, fed by both parents and by any helpers present, leave nest at 14–16 days; if nest approached, adults perform injury-feigning distraction display on ground; fledglings fed by adults for 4 weeks, remain with parents for 6–7 weeks. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*). Hatching success 0–60%, fledging success 0–33%. Greatest recorded longevity 4 years 7 months.

**Movements.** Mainly sedentary, but some local post-breeding movements to lower elevations or more open habitats: some movements involve dispersal by young. Longest movements of ringed individuals less than 10 km.

**Status and Conservation.** Not globally threatened. Common and widespread. Adjusts well to logging, and often recorded in modified habitats. Rapidly colonizes suitable areas after clearance or fires. **Bibliography.** Cale (1994), Campbell (1905), Dove (1910), Fletcher (1939), Galbraith (1974a), Higgins & Peter (2002), Keast (1958b), North (1903), Officer (1969), Ratkowsky (1984), Schodde & Mason (1999), Schulz & Menkhurst (1984), Sharland (1925), Thomas (1979).

## Subfamily PETROICINAE

### Genus *PACHYCEPHALOPSIS* Salvadori, 1879

#### 26. White-eyed Robin

*Pachycephalopsis poliosoma*

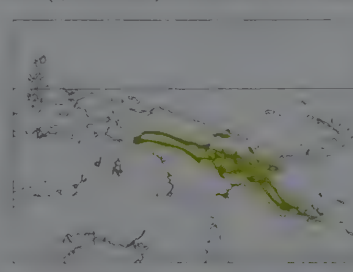
**French:** Miro aux yeux blancs **Spanish:** Petroica Ojiblanca  
**German:** Weißaugen-Dickichtschnäpper  
**Other common names:** Eastern White-eyed Robin, Grey/White-throated Shrike-robin, White-throated Robin(!)/Thicket-flycatcher

**Taxonomy.** *Pachycephalopsis poliosoma* Sharpe, 1882, Astrolabe Mountains, south-east New Guinea.

Affinities of genus uncertain; has in the past been associated with whistler genus *Pachycephala*, and sometimes merged with it. Placement within current subfamily somewhat tentative; further research required. Subspecific identity of population in Torricelli Mts uncertain. Seven subspecies recognized.

**Subspecies and Distribution.**

*P. p. albigularis* (Rothschild, 1931) – W & C New Guinea (Weyland Mts, Victor Emanuel Mts).  
*P. p. approximans* (Ogilvie-Grant, 1911) – S slopes of Snow Mts, in WC New Guinea.  
*P. p. idenburgi* Rand, 1940 – N slopes of C New Guinea mountains.  
*P. p. balim* Rand, 1940 – valleys of R Bele and R Balim (WC New Guinea).  
*P. p. humsteini* (Neumann, 1922) – mountains on upper R Sepik (EC New Guinea).  
*P. p. hypopolia* Salvadori, 1899 – mountains of Huon Peninsula (NE New Guinea).  
*P. p. poliosoma* Sharpe, 1882 – mountains of SE New Guinea.  
Also (race uncertain) Torricelli Mts in NC New Guinea.



**Descriptive notes.** 15–16.5 cm; 35–42 g. Nominat race is dark grey above, area from gape to ear-coverts sooty grey, uppertail-coverts slightly darker than back; upperwing and tail sooty grey; chin and throat mottled white, side of throat whiter and unmarked, underparts medium grey; iris pale grey or buffy; bill black; legs pinkish-grey to slate-blue. Sexes alike. Juvenile has upperparts dark olive-brown, lores very dark blackish-brown, chin white, throat, breast and flanks brown, white belly feathers tipped brown (mottled), undertail-coverts taw-coloured; immature differs from adult in having top of head, wings and tail much browner,

tinged chestnut, and some feathers on breast and abdomen faintly mottled brownish. Race *albigularis* has chin and upper throat white, wing and tail greyish-black, belly little paler than breast;



*approximans* is similar to previous, but white on throat reduced; *bulim* has crown and breast tinged brown, uppertail-coverts and tail more brownish, white on throat more reduced, belly more whitish, undertail-coverts buff; *denburgensis* like last, but crown and head side blacker, white on throat further reduced, remiges and rectrices edged darker brown; *hunsteini* has chin white with buff wash, throat grey, breast and belly darker, crown blacker, undertail-coverts buff; *hypopolia* is similar to last, but slightly smaller and paler. Voice. Song a distinctive series of 4–10 loud, far-carrying, buzzing humming notes, the first few unslurred and then gradually rising. Call a clear bell-like whistle, “perwee”, on rising scale.

**Habitat.** Hill forest and lower montane forest, mostly at 400–1700 m, generally above 700 m; to 2200 m in Snow Mts. In WC & C range, where sympatric with *P. hattamensis*, usually replaced by that species above 975 m.

**Food and Feeding.** Insects; circumstantial evidence of larger prey (such as eggs or nestlings) also taken. Frequents low substage, at or below 2.5 m from ground. Most prey captured by gleaning from or making sally-strikes to undergrowth vegetation or ground.

**Breeding.** Males with enlarged testes in Aug, newly hatched chick in mid-Aug and juvenile in early Nov, indicative of breeding during middle to late dry season, at least. Nest a cup of rootlets and green moss; one was placed 1.3 m from ground in sapling. Clutch 1 egg, buff-white, densely and evenly blotched brown and light purplish-grey, more purplish-grey markings forming cap at larger end. Size 27.3 × 19.8 mm. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally common to abundant. On Mt Karimui (E New Guinea) accounted for 12% of local avifauna in elevational zone of 1220–1280 m, where the most abundant species. Very secretive and difficult to observe; usually detected by voice.

**Bibliography.** Beehler (1978b), Boles (1982), Coates (1990), Croxall (1977), Diamond (1972), Frith (1971b), Gilliard & LeCroy (1961b), Iredale (1956), Ogilvie-Grant (1915), Rand (1942b), Rand & Gilliard (1967).

## 27. Green-backed Robin

### *Pachycephalopsis hattamensis*

**French:** Miro à dos vert **German:** Grünrücken-Dickichtschnäpper **Spanish:** Petroica Dorsiverde  
**Other common names:** Green/Western White-eyed Robin, Green Thicket-flycatcher/Whistler-robin, Green-backed Shrike-robin

**Taxonomy.** *Pachycephala hattamensis* A. B. Meyer, 1874, Hatam, Arfak Mountains, 3550 feet [c. 1080 m], north-west New Guinea.

Affinities of genus uncertain; has in the past been associated with whistler genus *Pachycephala*, and sometimes merged with it. Placement within current subfamily somewhat tentative; further research required. Five subspecies recognized.

**Subspecies and Distribution.**

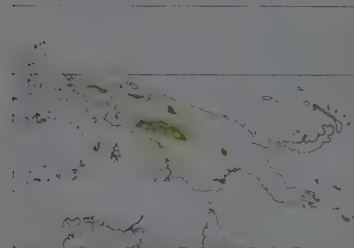
*P. h. hattamensis* (A. B. Meyer, 1874) – Vogelkop (Tamrau Mts, Arfak Mts), in NW New Guinea.

*P. h. ernesti* E. J. O. Hartert, 1930 – W New Guinea (Wandammen Mts).

*P. h. insularis* Diamond, 1985 – Yapen I, in Geelvink Bay.

*P. h. axillaris* Mayr, 1931 – WC New Guinea (Gauttier, Weyland, Nassau and Oranje Mts).

*P. h. lecrovayae* Boles, 1989 – Mt Sisa, in Southern Highlands Province (E New Guinea).



**Descriptive notes.** 15 cm; 33–35 g. Nominate race has crown, hindneck and side of head to below eye grey, lores white, back olive-green, uppertail-coverts rusty brown; flight-feathers dark brownish-grey, edged reddish-brown to olive-brown on outer webs, lesser and median upperwing-coverts olive-green; tail dark brownish-grey, rectrices edged reddish-brown to olive-brown; chin, upper throat and malar region white; underparts yellowish-olive, clearer and more yellow on lower abdomen, undertail-coverts orange, axillaries olive; iris pale grey; bill black; legs grey. Sexes alike. Juvenile undescribed. Race *ernesti* has breast

darker green, with grey wash on upper part; *insularis* similar to previous, but white on chin reduced, uppertail-coverts olive (not brown), tail darker; *axillaris* has underparts paler, axillaries more yellow; *lecrovayae* is darker overall, with throat white, lower breast lacking grey wash, undertail-coverts more orange, axillaries more olive. Voice. Includes 3 progressively higher up-slurred buzzy notes, usually followed by 2 higher notes at one pitch; a piercing whistled upslur, and a short repeated unslurred note.

**Habitat.** Hill forest and lower montane forest, mainly at 760–1650 m, locally to 2000 m. Where sympatric with *P. poliosoma*, usually replaces that species above 975 m.

**Food and Feeding.** Insects. Forages in low substage and on ground, particularly in areas with abundant ferns and tall herbs.

**Breeding.** Uncompleted nest found: composed of moss, placed c. 0.5 m from ground and well hidden in bend of liana. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Papuan Highlands EBA, North Papuan Mountains EBA, Central Papuan Mountains EBA and Yapen Secondary Area. Locally common, but secretive and easily overlooked; presence revealed in most cases by voice.

**Bibliography.** Boles (1989), Coates (1990), Diamond (1985), Hartert (1930), Iredale (1956), Mayr (1931a), Melville (1980), Rand & Gilliard (1967), Salvadori (1881), Stein (1936).

## Genus *EUGERYGONE* Finsch, 1901

### 28. Garnet Robin

#### *Eugerygone rubra*

**French:** Miro grenat **German:** Blutrückenschnäpper **Spanish:** Petroica Granate  
**Other common names:** Garnet Flycatcher/Flyeater, Red-backed Robin/Warbler, Red-backed/Fidgeting Flycatcher, Ruddy False-flycatcher

**Taxonomy.** *Pseudogerygone rubra* Sharpe, 1879, Tjebonda, Arfak Mountains, New Guinea.

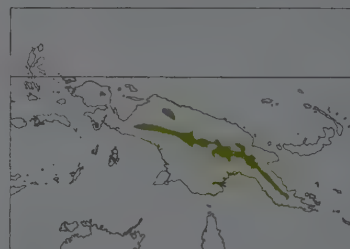
Formerly placed with *Gerygone* in family Acanthizidae, but external morphology (particularly the vertical white wing mark) and some behavioural traits indicate close affinities with Australasian robins of genus *Petroica*. Subspecific identity of populations in Kumawa and Foja Mts uncertain. Two subspecies currently recognized.

**Subspecies and Distribution.**

*E. r. rubra* (Sharpe, 1879) – Arfak Mts, in NW New Guinea.

*E. r. saturator* Mayr, 1931 – mountains of W, C & SE New Guinea (E from Weyland Mts).

Also (race uncertain) Kumawa Mts and Foja Mts on Bomberai Peninsula.



**Descriptive notes.** 10–11.5 cm; 9–11 g. Male nominate race has small white spot at base of forehead, rest of forehead dusky brown, face and ear-coverts dark grey, lores sooty black, broken white eyering in front and behind eye; otherwise dark crimson above, crown and hindneck slightly duller, upperwing dull blackish, inner primaries and secondaries with small white spot towards base of outer webs (forming oblique bar across folded wing), lesser wing-coverts dark crimson; tail black, outer rectrices tipped white, broadly so on outermost; light ashy grey below, breast and flanks darker, belly white, undertail-coverts and thighs sooty

grey with dark crimson wash; iris dark brown; bill blackish, or black with red lower mandible; legs red to brown or black, feet yellowish to reddish. Female is similar to male but duller, lacks white on forehead, has upperparts yellowish olive-green, legs dark brown, feet brownish-yellow. Juvenile has body chocolate-brown, wing grey; immature is dark cinnamon-brown above, pale cinnamon-brown below. Race *saturator* has upperparts brighter and more intensely coloured than nominate. Voice. Song very high-pitched, faint, tinkling, fluctuating alternately above and below one pitch. Call a delicate upslurred mewing note, “uwee”, “uweeo” or “deeyu”.

**Habitat.** Mountain-forest edges and overgrown gardens, at 1400–3680 m, mainly 1700–2500 m.

**Food and Feeding.** Insects. Forages mainly in outer foliage of middle and lower storeys, sometimes in undergrowth. Food obtained almost exclusively by gleaning from foliage, rarely by making sally-strikes. Sometimes joins mixed-species foraging flocks.

**Breeding.** Females in breeding condition in Nov, and fledgling seen in mid-Mar. Possible display by male involved rapidly flicking wings open, exposing white wingbar; sometimes pair-members perched side by side, facing same direction, and alternately extended wing on side facing partner outwards and downwards. Nest, possibly still under construction, a small cup of moss and possibly spider web, placed c. 5 m from ground at junction of two branches 5 mm in diameter, external diameter of nest 5 cm, height 3 cm; both sexes seen to visit nest. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Uncommon to rare.

**Bibliography.** Beehler (1978b), Beehler *et al.* (1986), Coates (1990), Croxall (1977), Diamond (1972), Filewood (1973), Gyldestolpe (1955a), Hopkins *et al.* (1988), Iredale (1956), Keast (1977a), Majnep & Bulmer (1977), Orenstein (1979), Rand (1942b), Rand & Gilliard (1967), Ripley (1964b), Salvadori (1881).







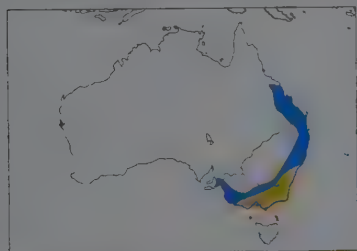
# Genus *PETROICA* Swainson, 1830

## 29. Rose Robin

### *Petroica rosea*

**French:** Miro rosé **German:** Rosenschnäpper **Spanish:** Petroica Rosada  
**Other common names:** Rose-breasted Robin, Rose Robin-flycatcher

**Taxonomy.** *Petroica rosea* Gould, 1840, Hunter River, New South Wales, Australia. Closely related to *P. rodinogaster*. Monotypic.  
**Distribution.** Breeds SE Australia from mid NE New South Wales S to S Victoria; non-breeding N to SE (rarely, CE) Queensland and, in S, W to SE South Australia (Fleurieu Peninsula).



**Descriptive notes.** 11–12 cm; 7–10 g. Male has head and upperparts dark grey, semicircular white forehead patch; upperwing dark grey-brown; tail sooty black, rectrix T3 with narrow white tip, T4 with large white tip interrupted by black along shaft on outer web, T5 with distal 40% white (except for dark subterminal patch on outer web), T6 white with small dark subterminal patch on outer web; chin and throat dark grey, breast to upper belly rose-red, middle of belly to undertail-coverts white; iris dark brown; bill black; legs very dark brown, soles yellow-orange. Female has crown, face and upperparts grey-brown, forehead spot and

eyering light buff to buffish-white, small buff-white patches at base of innermost primaries and secondaries (forming wingbar) and pale edges on distal half of secondaries (thin wingstripe), tail dark grey-brown with extensive white on outer three feather pairs, underparts light brownish-grey, paler towards belly, grey-brown wash on breast side and flanks, breast sometimes with pink flush; bill brownish. Juvenile has upperparts grey-brown with paler streaks, underparts mottled and streaked off-white and buff-brown, wing and tail as female; immature male similar to adult female, young male sometimes with pink flush on breast (lacking on immature female). Voice. Song a quiet sweet trill, "dick dick diddit deer deer", like a bell (or likened to sound of ball-bearing bouncing on a hard surface), last 2 notes higher. Contact call a nasal "neep", also "tick" like sound of snapping of dry twig; also harsh alarm note, various twitterings and churring.

**Habitat.** Rainforest and wet eucalypt (*Eucalyptus*) forest, often with acacias (*Acacia*), particularly gulleys. In non-breeding season, may disperse to drier, more open forest and woodland; occasionally gardens during passage.

**Food and Feeding.** Insects and other small arthropods. Most prey captured above 2 m from ground, sometimes up to 20 m; in one study, 3.4% of items taken on ground, 1.5% at 0–1 m, 3.9% at 1–2 m, 54.1% at 2–5 m, 37.1% above 5 m; in another, ground 10%, 0.2–4 m 55%, 4.1–10 m 23%, above 10 m 12%. Forages in outer foliage or by making aerial sallies; substrates used are air (26–48%), trunks and branches (23–25%), foliage (22–38%), ground (7–11%). Capture techniques are aerial flycatching (26–28%), sally-strikes (29–59%), gleaning (5–48%), pounce from perch (4–10%). Joins mixed-species foraging flocks.

**Breeding.** Season Sept–Feb; usually three broods, sometimes one or two. Suggestion that more than one female may brood young requires confirmation. Male courtship-feeds female. Nest built by female, construction work taking 7–14 days, a small deep cup of moss, occasionally grass, twigs or bark, externally bound with spider web and coated with lichen, lined with fur or fine plant fibre, external diameter 6.4–7 cm, height 6.4 cm, internal diameter 3.8–4.4 cm, depth 2.8–3.8 cm; placed up to 20 m from ground in horizontal fork. Clutch 2–3 eggs, pale blue-green or greenish-grey, finely spotted with various shades of brown, particularly at large end, average 16.7 × 13.2 mm; incubation by female, fed on nest by male, period 12–16 days; no information on duration of nestling period; nestlings and fledglings fed by both parents. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*), Brush Cuckoo (*Cacomantis variolosus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalus*). Greatest recorded longevity 9 years 4 months.

**Movements.** Migratory, with distinct N–S and altitudinal movements. Leaves S breeding areas in Mar–Apr; returns late Aug to Oct.

**Status and Conservation.** Not globally threatened. Locally common. Clearance of forest and woodland has led to some local extinctions; considered sensitive to loss of understorey and fragmentation of habitat.

**Bibliography.** Barrett *et al.* (2003), Boles (1988), Campbell (1901), Chisholm (1960), Fleming (1980), Griffiths & Clarke (2002), Higgins & Peter (2002), Howe (1928), Keast (1958b), Kernot & Hocking (1992), MacNally (2000), Mathews (1920b), Morris & Schrader (1978), North (1903), Officer (1969), Paton (1970), Paton *et al.* (1968), Recher & Holmes (1985), Recher *et al.* (1985), Reid *et al.* (1984), Schodde & Mason (1999), White (1920).

## 30. Pink Robin

### *Petroica rodinogaster*

**French:** Miro incarnat **German:** Rosenbrustschnäpper **Spanish:** Petroica Encarnada  
**Other common names:** Pink-breasted/Magenta-breasted Robin, Pink Robin-flycatcher

**Taxonomy.** *Saxicola Rodinogaster* Drapiez, 1819, Maria Island, Tasmania, Australia. Closely related to *P. rosea*. Two subspecies recognized.

**Subspecies and Distribution.**  
*P. r. inexpectata* Mathews, 1912 – breeds SE Australia in S & E Victoria and extreme SE New South Wales; non-breeding SE South Australia (E from Fleurieu Peninsula) E to SE New South Wales (to S of Sydney), extending inland to NC Victoria.  
*P. r. rodinogaster* (Drapiez, 1819) – Bass Strait islands, King I., Flinders I. and Tasmania.

**Descriptive notes.** 11.5–13 cm; 9–11 g. Male nominate race has head and upperparts sooty black, semicircular white forehead patch; upperwing, including greater wing-coverts, brown-black, median and lesser wing-coverts sooty black; tail sooty black, chin and throat sooty black, sharply delimited from pink breast and belly, lower belly and undertail-coverts white, flanks and thighs



sooty black; iris dark brown; bill black; legs very dark brown, soles yellow-orange. Female is warm olive-brown above, has forehead patch pale buff or off-white, lores off-white with greyish wash, eyering off-white, wing dark brown, dark buff patch at base of secondaries and dark buff edges of tertials and distal secondaries (forming double bar on folded wing), tail very dark brown; chin and throat buff-cream, underparts pale brown, greyish wash on breast, belly side and flanks, paler central belly and undertail-coverts paler; bill blackish with pale base of lower mandible. Juvenile has upperparts olive-brown with pale streaks,

upperwing-coverts edged buff, underparts mottled off-white and buff-brown; immature as female, young male sometimes with light pink flush on chest (lacking on immature female). Race *inexpectata* is smaller than nominate, male with larger frontal spot, female with warmer brown upperparts. Voice. Song a rapid trill, "chr t- tr-tr-r-r", low and weak but penetrating. Contact call "tick", like sound of small twig snapping; alarm a scolding "chur-r-r".

**Habitat.** Rainforest and wet eucalypt (*Eucalyptus*) forest, often with dense undergrowth; drier, more open habitats in non-breeding season.

**Food and Feeding.** Insects and other small arthropods. Feeds on ground and tree trunks and in low foliage. Prey captured with combination of aerial flycatching, sally-strikes and gleaning.

**Breeding.** Season Sept–Mar; one or two broods. Nest built by female, a small deep cup of moss and plant fibre, bound with spider web, often with exterior coating of lichens, lined with grass or fur, external diameter 6.5–7 cm (rarely, to 11 cm), height 5–7 cm (rarely, to 11 cm), internal diameter 3.5–5.1 cm, depth 2.5–3 cm; placed 0.5–7.9 m (usually c. 2 m) from ground in horizontal fork. Clutch 2–4 eggs, usually 3, dull greenish-white or green-grey, with brown markings concentrated towards larger end, average 18.7 × 14.2 mm; incubation by female, period 16 days; chicks brooded by female, fed by both parents, no information on duration of nestling period; fledglings fed by both parents. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalus*).

**Movements.** Resident, migratory and dispersive. Present throughout year in some areas. Others move into more open and/or drier habitats, and possibly some altitudinal shift; movements may be mainly by subadults. In autumn–winter, mainland breeders shift N & W; vagrant N to Sydney and W to Adelaide. No evidence that Tasmanian breeders cross Bass Strait to mainland.

**Status and Conservation.** Not globally threatened. Locally common. Common in Tasmania, although clearing of rainforest has reduced available habitat. Listed as "Vulnerable" in New South Wales.

**Bibliography.** Barrett *et al.* (2003), Black (1997), Boles (1988), Campbell (1901), Chisholm (1960), Green (1995), Griffiths & Clarke (2002), Higgins & Peter (2002), Howe (1932a), Keast (1958b, 1961), Lillier (1910), Loyn (1985a), Mathews (1920b), Newman (2002), Newman & Bratt (1976), North (1903), Officer (1969), Paton (1970), Paton *et al.* (1968), Rowley & Paton (1978), Schodde & Mason (1999), Sharland (1958), Shields & Boles (1980), Trudgeon (1975).

## 31. Snow Mountain Robin

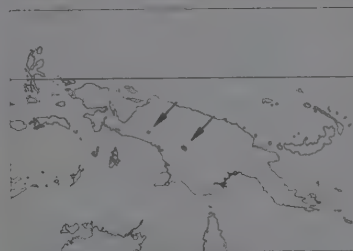
### *Petroica archboldi*

**French:** Miro des rochers **German:** Felsenschnäpper **Spanish:** Petroica Roquera  
**Other common names:** Alpine Robin(!), Rock Robin(-flycatcher), Snow Robin, Archbold's New Guinea Robin

**Taxonomy.** *Petroica archboldi* Rand, 1940, Mount Wilhelmina, 4100 m, Oranje Mountains, central New Guinea.

Monotypic.

**Distribution.** Mt Wilhelmina and Mt Carstenz (in Oranje Mts), in C New Guinea.



**Descriptive notes.** 14 cm. Male has crown and hindneck dark slate with reddish-pink tinge, side of head slate-grey, feathers at base of culmen and lores black, small white forehead patch; upperparts dark slate-grey, rump slightly paler; upperwing black, secondaries narrowly edged greyish on distal half of outer web, inner primaries and outer secondaries with white patch on inner web about third of distance from base (forming stripe on underwing); tail black, rectrices with basal half of outer web and distal half of inner web white, outermost feather with large white tip, adjacent two pairs narrowly tipped white; chin and throat slate-coloured.

tinged with reddish-pink, breast slate, centre with bright red spot, merging to grey on flanks. Belly greyish-white, undertail-coverts white, thighs slate; iris dark brown; bill and legs black. Female is similar to male but slightly smaller and paler, with red of breast paler. Immature is tinged brownish, lacks red breast patch. Voice. Song a wide range of notes resembling sound of "drops of water" and like some of the sounds made by parrots (Psittaciformes). Also loud "chip" calls and harsh scolding notes.

**Habitat.** Edge of bare rock slopes and cliffs, and among boulders on talus slopes; also in valleys among rocky tundra or alpine heaths. Occurs above timber-line, above c. 3850 m.

**Food and Feeding.** Insects. Largely terrestrial, feeding among rocks. Sits on rock while scanning surroundings; pounces on prey, and returns to perch.

**Breeding.** Adult feeding fledgling in Sept, and extensive singing (suggestive of breeding) in Dec–Feb. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Data-deficient. Restricted-range species; present in Central Papuan Mountains EBA. Originally reported as common within very small range; recent reports, however, are very limited, perhaps more a reflection of difficulty of visiting this remote location. Local mining operations have been suggested as possibly having deleterious effects on this species.

**Bibliography.** Anon. (2006), Bakker & Shattersfield (2004), Capper *et al.* (2003), Iredale (1936), Rand (1940), 1942b), Rand & Gilliard (1967), Schodde *et al.* (1975), Shattersfield & Capper (2000).



## 32. Flame Robin

*Petroica phoenicea*

**French:** Miro embrasé **German:** Flammenbrustschnäpper **Spanish:** Petroica Flamígera  
**Other common names:** Flame-breasted Robin, Flame Robin-flycatcher

**Taxonomy.** *Petroica phoenicea* Gould, 1837, Sydney, New South Wales, Australia. Monotypic.  
**Distribution.** Breeds SE Australia from NE New South Wales S to S Victoria, islands in Bass Strait (King I, Flinders I) and Tasmania; non-breeding N to far SE corner of Queensland, inland to C New South Wales and, in S, W to SE South Australia (E from Yorke Peninsula).



**Descriptive notes.** 12–14 cm; 11–14.5 g. Male has head and upperparts dark grey, white forehead spot; upperwing dark grey, marginal secondary coverts grey, median and greater secondary coverts white, outer edges of tertials and distal portion of secondaries white, white patch on inner web of inner primaries and outer secondaries (on folded wing white areas combine to form broad elongate stripe, in flight form leading patch extending into trailing stripe); tail dark grey, amount of white variable, on some individuals T2–T4 with small white tips, T5 with larger tip, T6 all white except for subterminal black patch on outer web and basal two-thirds of inner web, on other birds white restricted to T5 and T6, on T5 forming terminal patch on inner web; chin sooty black, throat, breast and upper belly orange-red, lower belly, rear flanks and undertail-coverts white; iris dark brown; bill black; legs black. Female has head and upperparts brown, small frontal spot pale buff, narrow white eyering; upperwing dusky brown, outer and middle primaries (except outermost two) with small buff spot at about mid-point of outer web, successively inwards shifting towards base, on inner primaries and secondaries becomes broad buff patch closer to base and across both webs, longest tertial edged buffy white, median secondary coverts with indistinct light brown tips (on folded wing buff markings form small bar near leading edge, larger patch near middle and thin trailing stripe, in flight form broad wingstripe); tail as male, but dark grey replaced by dark brown; chin and throat pale greyish-brown, breast slightly darker, merging with off-white on belly and undertail-coverts, some individuals with pale orangish wash on breast. Juvenile is brown with pale streaking above, wing and tail as female, underparts mottled and streaked whitish-buff and grey-brown; immature similar to female. **Voice.** Song a slightly descending piping sequence in three groups of 3 notes, transcribed as e.g. “you-may-come, if-you-will, to-the-sea”, repeated incessantly. Contact call “tip”; wheezing note at nest-site by displaying male.

**Habitat.** Breeds in upland wet to moist eucalypt (*Eucalyptus*) forest and woodland with open understorey, to 1800 m; non-breeding at lower altitudes, in drier open habitats such as dry eucalypt forest and woodland, grassland, farmlands, parks.  
**Food and Feeding.** Arthropods. Feeds on ground, often pouncing on prey from low perch. Marked seasonal shift in time spent on or near ground. Following figures based on extensive study at several sites in SE highlands of New South Wales and at Seaford (Victoria), with over 5000 records. Most perches at or below 1 m, but varying seasonally, spring 86.9% of records, summer 49.6%, autumn 50.4%, and winter 96.5%; in summer and autumn higher perches used more frequently, e.g. for summer 17.9% at 1–3 m, 10.4% at 3–5 m, 20.6% at 5–16 m and 1.5% at 16–30 m. Most prey captured on ground and in air, but again major differences in spring (ground 70.3%, air 21.4%), summer (ground 29.5%, air 45.1%), autumn (ground 27.3%, air 35%) and winter (ground 89%, air 9.5%); branches, trunks, foliage and logs/rocks important in summer and autumn, but have little significance at other times. Main foraging techniques vary with season: in spring, pounce 53.7%, aerial sally 20.3%, sally-strike 10.4% and glean 15.6%; in summer, pounce 27.9%, aerial sally 43.7%, sally-strike 25.1% and glean 3.8%; in autumn, pounce 20.7%, aerial sally 35%, sally-strike 32.4% and glean 11.9%; in winter, pounce 16.8%, aerial sally 9.6%, sally-strike 1.4% and glean 72.1%. Has been seen to hold one leg forward and rapidly patter foot on ground, often followed by dash to capture insect.

**Breeding.** Season Aug–Feb; up to three broods. Breeds as pair, remating each year; pair-bond broken at end of season, but may re-form pair with same mate in subsequent season. Territorial during breeding; holds mutually exclusive territories against *P. boodang*. Male feeds female during courtship and through all stages of cycle; in courtship display flies in front of female or displaces her, and chase follows; male also rocks back and forth in front of female while in crouched position, wings lowered, head tilted downwards. Nest built by female, construction time 3–13 days (usually c. 5–5 days), a cup made of grass, fine bark strips, rootlets and fern down, coated externally with spider web, often with bark and lichen attached to outside, lined with fine grass, rootlets, small feathers, hair and plant fibres, external diameter 6.9–12.7 cm, height 5.7–8.9 cm, internal diameter 4.4–5.1 cm, depth 3.2–3.8 cm; laced up to 35 m above ground (usually 4–8.5 m up), in situation where sheltered above, such as in cavity or hollow, on ledge, between bark and trunk, rarely on ground between roots, sometimes in man-made structure. Clutch 3 eggs, occasionally 4, pale warm blue, finely spotted with shades of brown, sometimes in zone around large end, some with large blotches, average size 18.3 × 14.2 mm, laying starts on day following nest completion to up to 13 days after, incubation by female, period 15–17 days; young hatched with first down appearing on head c. day 2; chicks brooded by female, fed by her for first 3 days with food supplied by male, thereafter male feeds them directly, nesting period 15–20 days, usually c. 17 days; young fed by both sexes for 21–37 days after leaving nest. Nests parasitized by Pallid Cuckoo (*Coccyus pallidus*) and Fan-tailed Cuckoo (*Coccyus flabellifrons*). Hatching success c. 40%; fledging success c. 20%. Nest predators include Grey Shrike-thrush (*Colluricincla harmonica*), Pied Currawong (*Strepera grisea*), and snakes. Greatest recorded longevity 9 years 2 months.

**Movements.** Migratory. Departs from breeding grounds in Mar, although in some areas (including higher altitudes) present throughout year. On Australian mainland, descends to lower altitudes along W slopes of Dividing Range, and migrates N, occasionally to SE Queensland, and W to extreme SE South Australia. In some areas, at least, sexes migrate separately, males 5–9 days before females; elsewhere, females arrive before males and depart later. Travels in small flocks, usually of 12–15 individuals, occasionally up to 30, often returns to same area for several successive winters. Arrives back in breeding areas in Aug. Uncertain if those breeding in Tasmania cross Bass Strait to mainland. Great majority (98.6%) of retraps of marked individuals within 10 km of site where originally ringed; only 0.03% at 10–49 km and 0.03% at or beyond 100 km; longest-distance recovery 351 km.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Very common in high country of St. Australia and in Tasmania; global population thought likely to exceed 1,000,000 individuals. Appears to have declined greatly since c. 1980; reasons for this not fully clarified, but in some areas on W peninsula loss and degradation of non-breeding habitat perhaps a responsible factor. Much of this species’ breeding range, however, lies within relatively undisturbed upland forests, and most of non-breeding in agricultural country. Most likely reason for decline believed to be related to rise in ambient temperature

**Bibliography.** Anon. (2006c), Bateman (1975), Bateman & Fordyce (1970), Bedgood (1983), Butchart & Stattersfield (2004), Cale (1994), Campbell, A.G. (1909), Chisholm (1960), Cooper, R.P. (1967, 1970), Disney & Stokes (1976), Elliott & Elliott (1931a), Favalaro (1953), Fleming (1980), Fordyce (1978), Garnett & Crowley (2000), Griffioen & Clarke (2002), Hamilton (1981), Higgins & Peter (2002), Hobbs (1954), Hough (1972), Howe (1932a), Lingham (2004), Newman (2002), Pescott (1969), Recher & Holmes (1985, 2000), Recher *et al.* (1985), Reilly (1968a, 1968b), Robinson (1989a, 1989b, 1990a, 1990b, 1992a, 1992b, 1993), Schodde & Mason (1999), Shields & Recher (1984), Stokes (1975), Talmage (1992, 1993, 1995), Thomas (1969).

## 33. Alpine Robin

*Petroica bivittata*

**French:** Miro montagnard **German:** Bergwaldschnäpper **Spanish:** Petroica Montañesa  
**Other common names:** New Guinea/Cloudforest Robin, Forest/Mountain Robin(flycatcher)

**Taxonomy.** *Petroica bivittata* De Vis, 1897, Mount Scratchley, 12,200 feet [c. 3720 m], south-east New Guinea. Two subspecies recognized.

**Subspecies and Distribution.**

*P. b. caudata* Rand, 1940 – Nassau Range and Oranje Range, in WC New Guinea.

*P. b. bivittata* De Vis, 1897 – EC & SE New Guinea: Central Highlands (Mt Hagen, Mt Giluwe and Lamende Range), and Wharton and Owen Stanley Ranges (Mt Albert Edward, Mt Scratchley, Mt Knutsford, Mt Victoria, Mt Thumb).



**Descriptive notes.** 11.5 cm. Nominative male has head, neck and upperparts black, small white forehead patch; remiges and greater upperwing-coverts brownish-black, lesser and median coverts black; tail black, outer rectrix with distal end white (more than half of feather length on some individuals), next two feather pairs with small white tips; chin and throat to breast black, remainder of underparts white or greyish-white, thighs smoky grey; iris dark brown; bill and legs black. Female like male but duller, black areas sooty grey, not well demarcated from greyish-white belly and flanks, outer rectrix with outer web and tip white. Juvenile undescribed. Race

*caudata* smaller, with white in tail much reduced. **Voice.** Song a loud, deliberate “dad dad dad dad”. **Habitat.** High mountain forest, subalpine shrubland, and ecotone between subalpine forest and alpine grassland; found at 3900 m on Carstensz Massif (Nassau Range), 3050–3500 m in Central Highlands, and 2750–3700 m in Wharton and Owen Stanley Ranges.

**Food and Feeding.** Insects. Forages in canopy (c. 75% of observations) and in middle storey (c. 25%). Prey captured almost entirely by aerial flycatching.

**Breeding.** Eggs grey-brown with grey-brown spots, 22–24 × 15.8–17.8 mm. No other information. **Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains EBA. Uncommon. Poorly known species.

**Bibliography.** Coates (1990), Croxall (1977), Diamond (1972), Gregory (1994), Iredale (1956), Mayr & Rand (1937), Rand (1940a), Rand & Gilliard (1967), Rothschild & Harten (1903c), Schodde *et al.* (1975), Schönwetter & Meise (1976).

## 34. Scarlet Robin

*Petroica boodang*

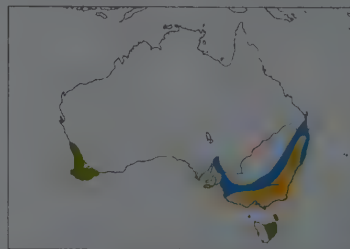
**French:** Miro boodang **German:** Australienscharlachschnäpper **Spanish:** Petroica Escarlata  
**Other common names:** Scarlet Robin-flycatcher, Scarlet-breasted/White-capped Robin

**Taxonomy.** *Muscicapa boodang* Lesson, 1838, Sydney, New South Wales, Australia. Forms a species group with *P. multicolor* and *P. macrocephala*. Conventionally considered conspecific with former, but differs in plumage (more white on forehead, wing and tail, greyer female), morphology and size. Has been recorded as hybridizing with *P. goodenovii*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. b. campbelli* Sharpe, 1898 – SW Western Australia; probably S South Australia (S Eyre Peninsula). *P. b. boodang* (Lesson, 1838) – breeds SE South Australia (SE from Kangaroo I, Fleurieu I) and from SE Queensland S to Victoria; non-breeding N to Flinders Ranges in W, to about Fraser I (E Queensland) in E, and inland towards C New South Wales.

*P. b. leggii* Sharpe, 1879 – Flinders I and E Tasmania.



**Descriptive notes.** 12–13.5 cm; 12–14 g. Male nominate race has head, neck and upperparts black, extensive white forehead spot; upperwing black, except for white median and greater secondary coverts, base of secondaries, and edges of longest tertial and inner secondaries (form white patches on folded wing and in flight); tail black with varying amounts of white, central feather pair all black, next two pairs narrowly tipped white (all black on some individuals), T4 with larger white tip, next pair white except for black base and subterminal spot on outer web, outermost rectrix white except for subterminal spot on outer web; chin and throat black, breast

and upper belly scarlet, remainder of underparts white; iris dark brown; bill black; legs dark brown. Female is grey-brown above, forehead buff-white, wing dark grey-brown, marginal coverts edged white, outer webs of inner primaries with pale spot about mid-point of outer web, secondaries with off-white patch near base, longest tertial and inner secondaries edged white (form bar and thin stripe on folded wing, broad stripe in flight); tail dark grey-brown, patterned as male; chin and throat grey-brown, breast light brown, usually with reddish wash, belly off-white. Juvenile is grey-brown with pale streaking above, wing and tail as female, underparts mottled and streaked off-white, buff and brown, immature as female but without reddish breast wash. Race *campbelli* has shorter wing and tail than nominate, and female has darker throat and upperparts and more red on breast. Race *leggii* has longer bill and legs, and darker tail. **Voice.** Song a whistling trill, “wee-chee-tee-tee-dah”. Contact call “chirp”. Other calls include low trilling notes, short “tick”, and “whee” like sound of finger rubbing on glass.

**Habitat.** Eucalypt (*Eucalyptus*) forest and woodland, particularly with open shrubby or grassy understorey, dispersing in autumn–winter also to more open habitats or areas including urban situ-



ations; occasionally found in mallee woodland, pine (*Pinus*) plantations, gardens and parks, and regenerating forest 20–80 years after logging. Sea-level to 1000 m.

**Food and Feeding.** Arthropods. Forages on or near ground, often pouncing on prey from low perch; feeds mainly at or below 1 m. Exhibits seasonal shifts in foraging substrates, heights and techniques. Following figures based on extensive study (more than 6000 records) at several sites in SE New South Wales and NE Victoria. Foraging heights greatest in summer–autumn, and marked shift towards ground in spring–winter: in spring, 80.5% at 0–1 m, 7.8% at 1–3 m, 2.8% at 3–5 m, 7.7% at 5–16 m and 1.2% at 16–30 m; in summer, 39.9% at 0–1 m, 13.3% at 1–3 m, 9.9% at 3–5 m, 34.4% at 5–16 m and 2.5% at 16–30 m; in autumn, 47.9% at 0–1 m, 17.4% at 1–3 m, 10.7% at 3–5 m, 22.5% at 5–16 m and 1.5% at 16–30 m; in winter, 82.5% at 0–1 m, 6.8% at 1–3 m, 4% at 3–5 m, 5.4% at 5–16 m and 1.3% at 16–30 m. Substrate on which prey taken also changes seasonally, with greater proportion on ground in winter–spring, more in air and on bark in summer–autumn: in spring, 77.6% on ground, 8.6% in air, 7% on trunk/branch, 4.1% on foliage, 1.7% on logs/rocks; in summer, 31.1% on ground, 23.7% in air, 30.1% on trunk/branch, 13.7% on foliage, 1.4% on logs/rocks; in autumn, 36.5% on ground, 21% in air, 31.5% on trunk/branch, 9.3% on foliage, 1.7% on logs/rocks; in winter, 86.2% on ground, 3.3% in air, 3.5% on trunk/branch, 5.1% on foliage, 1.9% on logs/rocks. Major capture actions are pounce, sally to air and sally-strike, with small amount of gleaning, proportions again varying seasonally: in spring, pounce 71.6%, aerial sally 7.8%, sally-strike 19.7%, glean 0.7%; in summer, pounce 29.9%, sally to air 22.1%, sally-strike 46.8%, glean 1.2%; in autumn, pounce 32.5%, sally to air 18.7%, sally-strike 44.2%, glean 4.6%; in winter, pounce 71.4%, sally to air 2.8%, sally-strike 24.3%, glean 1.5%. Small prey eaten directly; larger items bashed on branch or other hard surface before being consumed. May join mixed-species foraging flocks in winter.

**Breeding.** Season Jul–Feb; two or three broods, occasionally up to five attempted. Breeds as pair. Maintains territory throughout year. Male courtship-feeds female. Nest built by female, construction work taking 4–10 days, a compact cup of bark strips, rootlets and grass, bound externally with spider web, decorated on outside with lichen and moss, lined with plant down, fur and feathers, external diameter 7–8.9 cm, height 5.7–7.6 cm, internal diameter 3.8–5.1 cm, depth 3.2–5.1 cm; placed in horizontal or inclined fork, sometimes in hollow stump or small cavity, from almost at ground level to 24 m up (usually c. 6 m); territory 3–6 ha, sometimes up to 17 ha. Clutch 1–4 eggs, usually 3, pale blue, grey or green, spotted or blotched with dark brown and olive-brown, markings spread across shell or densest at large end, average size 18.7 × 14.2 mm, 3–9 days between completion of nest and start of laying; incubation by female, occasionally assisted by male, period 14–18 days; chicks brooded by female, fed by both parents, leave nest at 16–18 days; female fed on nest by male; fledglings fed by both sexes. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Brush Cuckoo (*Cacomantis variolosus*), Pallid Cuckoo (*Cuculus pallidus*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Hatching success 48–56%, fledging success 8–40%; recorded predation by snakes. Greatest recorded longevity 10 years 1 month.

**Movements.** Mainly sedentary; some local movements, particularly during autumn–winter, when shifts to more open habitats or lower elevations. Most ring recoveries less than 10 km from site of original capture; one individual moved 72 km.

**Status and Conservation.** Not assessed. Fairly common. Some local declines recorded in parts of South Australia and Victoria, in Sydney region of New South Wales and in SW Western Australia, with possible contraction of range, mainly because of habitat loss. Conversely, will colonize areas where fire or clearance has removed understorey.

**Bibliography.** Barrett *et al.* (2003), Bedgood (1983), Boles (1988), Brooker, M.G. (1998), Cale (1994), Campbell (1901), Chisholm (1960), Cooper (1971), Coventry (1989), Debus (2006a, 2006b, 2006c), Favaloro (1953), Fleming (1980), Ford *et al.* (1990), Galbraith (1974a), Garnett & Crowley (2000), Higgins & Peter (2002), Huddy (1979), Johnstone & Storr (2004), Keast (1958b, 1985), Kellaway (1925), McCarthy (2006), Mitchell (1972), Newman (2002), North (1903), Officer (1969), Pepper (1966), Recher & Davis (1998), Recher & Holmes (1985, 2000), Recher *et al.* (2002), Robinson (1989a, 1989b, 1990a, 1990b, 1992a, 1992b, 1993), Schodde & Mason (1999), Serventy & Whittell (1976), Shields & Recher (1984), White & Mellor (1921).

## 35. Pacific Robin

### *Petroica multicolor*

**French:** Miro écarlate **German:** Südsee-Scharlachschänpper **Spanish:** Petroica Multicolor

**Taxonomy.** *Muscicapa multicolor* J. F. Gmelin, 1789, Norfolk Island.

Forms a species group with *P. hoodang* and *P. macrocephala*. Conventionally considered conspecific with former, but differs in plumage (reduced white on forehead, wing and tail, browner female), morphology and size. Relationship between nominate race and *P. macrocephala* of New Zealand requires further investigation. Fourteen subspecies recognized.

#### Subspecies and Distribution.

- P. m. septentrionalis* Mayr, 1934 – Bougainville I.
- P. m. kulambangrae* Mayr, 1934 – Kolombangara, in W Solomon Is.
- P. m. dennisi* Cain & L. C. J. Galbraith, 1955 – Guadalcanal, in S Solomons.
- P. m. polymorpha* Mayr, 1934 – San Cristobal (Makira), in SE Solomons.
- P. m. soror* Mayr, 1934 – Vanua Lava, in Banks Is.
- P. m. ambrynnensis* Sharpe, 1900 – Banks Is (Meralba, Gaua) and N & C Vanuatu (Espiritu Santo, Aoba, Ambrym, Paama, Lopevi, Tongoa).
- P. m. feminina* Mayr, 1934 – C Vanuatu (Éfaté, Emao).
- P. m. cognata* Mayr, 1938 – Erromango, in SC Vanuatu.
- P. m. similis* G. R. Gray, 1860 – S Vanuatu (Tanna, Aneityum).
- P. m. multicolor* (J. F. Gmelin, 1789) – Norfolk I.
- P. m. kleinschmidti* Finsch, 1876 – W & N Fiji (Viti Levu, Vanua Levu).
- P. m. taveunensis* Holyoak, 1979 – NE Fiji (Taveuni).
- P. m. heeki* Mayr, 1934 – S Fiji (Kadavu).
- P. m. pusilla* Peale, 1848 – Samoa (Savai'i, Upolu).

**Descriptive notes.** 11.5–13.5 cm; 13–15 g (*dennisi*), 9–10 g (*kleinschmidti*). Nominative male has large white spot on forehead and forehead; rest of head black, upperparts black; upperside black, white on inner greater wing-coverts and tips of median coverts and diffuse white spots on bases of inner webs of inner primaries and secondaries (forming small shoulder patch and barely visible central wingbar on folded wing, wingstripe in flight); tail black, outer two feather pairs narrowly tipped white; chin and upper throat black, lower throat, breast and most of belly scarlet, crissum white, thighs black; iris brown; bill and legs black. Female has forehead light grey-brown, side of head mottled buffy, brown and grey, lores off-white, eyering buff; otherwise brown above, outer webs of inner primaries with pale spot about third of way from base and secondaries with off-white patch near base (form bar on folded wing, wingstripe in flight), tail dark brown, outer two feather pairs narrowly tipped off-white; chin and upper throat off-white, lower throat to upper belly light orange-scarlet, side of breast and flanks pale brown, a slight orange-scarlet wash on breast side. Juvenile grey-brown with pale streaks; immature like female, but lacks reddish wash on breast. Races vary mainly in plumage coloration, including amount of white, and in degree of sexual dimorphism, extent of retarded (fe-



cinnamon tinge above, white forehead patch absent, throat off-white with pale greyish-brown (and sometimes pinkish) wash, extent of scarlet below not so extensive; *soror* is like previous but darker and less brownish, male with more extensive scarlet on throat and reduced olive-grey wash on upper breast and sides; *cognata* is similar to last, but upperparts more greyish, more white in tail, particularly on outermost retractor, throat with reduced red; *polymorpha* male is dimorphic, some with black head and others with rusty-coloured head, female resembles latter morph but duller and with browner crown; *septentrionalis* male is indistinguishable from black-headed male of previous, female has more rufous-brown upperparts, little white in wing, and more extensive red below; *kulambangrae* male is like previous, female differs in having more reddish wash on upperparts and more intense red on underparts; *dennisi* like *polymorpha*, with male inseparable from black-headed morph, female with crown darker olive-brown and back blacker; *pusilla* male has head and upperparts sooty black, considerable white in wing (median coverts and inner greater coverts, spot near base of outer web of outer primaries, bar on inner web of secondaries and inner primaries, edging of some secondaries), buffy outer retractor with blackish-brown on inner web and on basal third of outer web, adjacent two feather pairs with more or less extended areas of buffy white, lower throat to upper belly red, lower flanks and belly and undertail-coverts white, female has black areas more sooty, white patches on forehead and wing smaller, edging on secondaries more pronounced, red below duller and more restricted to breast; *kleinschmidti* male is similar to previous, but forehead spot considerably larger, upperparts slightly darker, white stripe on underwing broader and more extended, female quite different from previous in having upperparts greyer, wing and tail lighter, wingbar broader, throat with paler wash, breast paler and pinker, flanks and belly to undertail-coverts off-white; *taveunensis* similar to previous, but red of breast slightly deeper and more extensive, female brown above with face and wingbar tinged with ochre; *becki* is similar to *kleinschmidti*, except that male has lighter upperparts, pale edging of secondaries much narrower, middle of throat often with reddish mottling, rear flanks with more extensive red, and female has lighter upperparts with cinnamon tinge, red on underparts extending to middle of throat and along flanks, rusty wash on breast side and flanks. **Voice.** Song varies among races, described variously as high-pitched tinkling note (Bougainville), pleasant whistling "twee-weeweeet" (Vanuatu), sweet whistle running down scale in quick succession, first two syllables generally extended (Fiji), and "teetu-teetutui" (Samoa). Other vocalizations include plaintive "plink" (Fiji), contact call a plaintive "teet-teet" (Vanuatu), alarm "tchee-zteazeazea"; also a ticking warning call.

**Habitat.** Generally primary forest, but in some areas enters more open adjacent habitat. On Norfolk I inhabits mature rainforest, occasionally palm and introduced olive (*Olea*) stands, rarely exotic eucalypt (*Eucalyptus*) forest; prefers forest no taller than 10 m, and having rather open ground layer with deep moist leaf litter. On Bougainville, occupies mountain forest at c. 1200–1950 m. In Solomons, hill forest to moss forest and stunted montane forest above 1000 m on Kolombangara, and higher mist forests above 1370 m on Guadalcanal; hill forest and primary stunted montane forest and ridge forest above c. 680 m on San Cristobal, where also occurs in partially cleared areas, plantations and gardens. In Vanuatu, found in forest, heavy riparian growth, sometimes clearings, plantations and gardens, from sea-level to high altitudes. Occupies mature forest in Fiji: on Viti Levu forest and tall secondary forest at 110–680 m, on Taveuni forest clearings, more open wooded areas, secondary shrub and edge of agricultural land at 450–970 m. Primary and secondary forest, less frequently adjacent areas, in Samoa.

**Food and Feeding.** Insects and other invertebrates, such as spiders (Araneae) and pseudoscorpions (Pseudoscorpiones). Forages mostly in substage and middle stratum of forest, on Bougainville generally more than 2 m from ground; occasionally ascends to canopy, as in e.g. Vanuatu. In Vanuatu, most prey captured by aerial flycatching, by making sally-strikes, by gleaning or by pouncing. In Fiji, flycatching more prevalent (47% of attacks), also sally-striking from trunks and branches and pouncing. In Samoa, combination of pouncing and aerial flycatching. Joins mixed-species foraging flocks.

**Breeding.** Breeds Sept to late Dec on Norfolk I and Oct–Jan in Vanuatu; in Solomons, dependent juveniles in mid-Aug on Kolombangara and female feeding young in early Sept on San Cristobal; Jun–Sept in Samoa, including dependent fledglings in early Jul, and nest with eggs in early Sept. Territorial. Nest a small cup of fine plant fibres, bound with spider web, with lichen or moss attached externally, lined with plant fibres or feathers, in Samoa external diameter 10 cm and height 6 cm; usually placed in fork in small branch, occasionally on small branch or in tree hollow, at 1–15 m on Norfolk I, usually below 10 m on Bougainville, at 8 m on San Cristobal, from near ground to lower canopy in Vanuatu, at c. 3 m in Fiji and at 1–6 m in Samoa; on Norfolk I, territory size 0.42–0.73 ha. Clutch 2–4 eggs, usually 2 on Norfolk I and 2–3 in Fiji, dull greyish-white to pale greenish, with grey and brown spots and blotches often forming cap or zone near large end, average size (Norfolk I) 19.5 × 15 mm; incubation by female, chicks fed by both parents; no information on duration of incubation and nesting periods. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*). In one study on Norfolk I, at least 36.4% of nests fledged at least one young. First-year individuals will attempt courtship. Adult survival 70%, female mortality higher than that of male.

**Movements.** Sedentary. In Vanuatu, same individuals regularly found in same sites, although there may be some local movements in non-breeding season.

**Status and Conservation.** Not assessed. Generally common to uncommon. Norfolk I population (nominate race) has declined and contracted since c. 1960, until only c. 400 pairs at start of 21st century; adversely affected by clearance and modification of native habitat, predation on adults and fledglings by cats and nest predation by rats (*Rattus*); this race regarded as "Vulnerable". In rest of range generally common, sometimes uncommon. In Vanuatu, preferred lowland habitat largely cleared. In Solomons, common at 1000 m but highest densities above 1100 m on Kolombangara, and common above 680 m on San Cristobal. In Samoa widespread but not common, being most numerous at higher altitudes.

**Bibliography.** Armstrong (1932), Ashmole (1963), Becken & Becken (1978), Bechie & Baumann (2003), Bellingham & Davis (1988), Blackburn (1971), Bregulla (1992), Buckingham *et al.* (1990), Cain & Galbraith (1955, 1956), Coates (1990), Dinnitt (1929), Dinnitt (1978), Dinnitt (2003), Galbraith & Galbraith (1962), Garnett & Crowley (2000), Gorman (1975), Haeden (1981), Hermes (1985), Higgins & Peter (2002), Holyoak (1979), Philp (1999), Robinson (1989), Serventy (1989), Sharpe (1900), Storer (1978), Storer & Dinnitt (1978), & Muse (1982), Pratt *et al.* (1987), Reed (1980), Robinson (1988, 1997), Schodde & Mason (1999), Schodde *et al.* (1983), Tarburton (1992), Wakelin (1968), Watling (1982), Wetmore (1925).



## 36. Tomtit

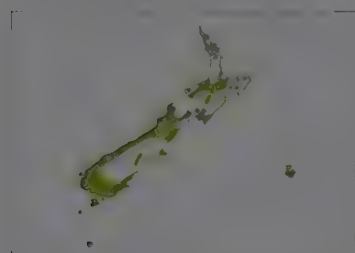
*Petroica macrocephala*

**French:** Miro mélangé **German:** Maorischnäpper **Spanish:** Petroica Carbonera  
**Other common names:** New Zealand Tit/Tomtit, Pied/Yellow-breasted Tit; South Island Tit (*macrocephala*); White-breasted tit (*toititi*); Chatham Island Tit (*chathamensis*); Auckland Island Tit (*marrineri*); Black/Snares Tit (*dannefaerdi*)

**Taxonomy.** *Parus macrocephalus* J. F. Gmelin, 1789, Queen Charlotte Sound, New Zealand. Forms a species group with *P. boodang* and *P. multicolor*. Relationship of nominate race of latter with present species requires investigation. Has been proposed that races should each be elevated to rank of species, for purpose of consistency with treatment accorded to mainland *P. australis* and its nominal derivative *P. trapezoides* (five subspecies currently recognized).

**Subspecies and Distribution.**

*P. m. toititi* (Lesson, 1828) – North I and adjacent islands (Hen and Chickens, Little Barrier, Great Barrier, Kapiti), in N New Zealand.  
*P. m. macrocephala* (J. F. Gmelin, 1789) – South I, Stewart I and outlying islands (including D'Urville, Pickersgill, Resolution, Codfish and South Cape).  
*P. m. dannefaerdi* (Rothschild, 1894) – Snares Is (Snares I, Broughton I).  
*P. m. marrineri* (Mathews & Iredale, 1913) – Auckland Is (Enderby, Ewing, Rose, Ocean, Adams, Auckland).  
*P. m. chathamensis* C. A. Fleming, 1950 – Chatham Is (Pitt I, Rangitira I, Mangere I, occasionally also Little Mangere I).



**Descriptive notes.** 13 cm; 11 g. Male nominate race has head, neck and upperparts black, small white forehead spot; upperwing black, white bar across bases of remiges (except outermost primary); tail with central three feather pairs black, T4 black with distal half of inner web white, T5 white with black base, tip and distal third of outer web, T6 white with black base and broad black tip; chin, throat and upper breast black, remainder of underparts pale yellow, often with brighter yellow or orange bordering sharp demarcation against upper breast; iris dark brown; bill black, legs black to dark purplish-brown, feet with soles (at

least) yellow to pink-brown or grey. Female is similar to male, but dark olive-brown above, narrow white eye-ring, ear-coverts finely streaked white, black of wing and tail replaced by blackish-brown, chin and throat mottled or washed dark grey, underparts yellowish-white, breast often washed olive-brown. Juvenile is duller and browner than adult, with mottling and fine streaking; immature as adult. Race *toititi* is similar to nominate, but male has lower breast to undertail-coverts white; *chathamensis* is larger, male has T4 tipped black and undertail-coverts black, female is warmer brown with dark face and with black line above forehead spot; *marrineri* has lower breast and belly yellow-white, grading to off-white on flanks and crissum, flank feathers tipped black, undertail-coverts black, tail variable, like that of previous or nominate or with white subterminal spot on inner web of T3. Female like male but usually browner and with underparts paler; *dannefaerdi* is distinctive, with plumage entirely black. Voice. Song a musical warble, "ti-oly-oly-ho" or "yodi-yodi-yodi". Gives 1–5 "zet" notes when foraging alone, possibly as contact call; also 2–7 "seet" notes when disturbed, soft closely spaced whistles.

**Habitat.** Native forests, both mature and regrowth, from lowland podocarp-broadleaf to southern beech (*Nothofagus*) in highlands, various mixed forests and manuka (*Leptospermum*) and kanuka (*Kunzea*) scrublands; will use exotic pine (*Pinus*) plantations, occasionally farmland, parks and gardens. On Auckland Is, scrub and littoral vegetation and *Olearia* forest, nearby open turf, tussock grassland and coastal rocks; scarce above 150 m, and absent from highest areas. On Snares Is, mainly tussock grassland with scattered scrubs.

**Food and Feeding.** Invertebrates, mainly insects; occasionally fruit of a range of species. Forages at all heights, although on larger islands prefers understorey of mature forest, and on small islands or in exotic vegetation often spends more time on ground. Most time spent in searching for prey from elevated perch. On South I (nominate race), little time on ground (0–3%), most time in understorey (60–80%), particularly lower part, and some use of canopy (10–16%) and above (less than 5%). On Rangitira I (*chathamensis*), 6–7% of foraging on ground, 72–1% in lower storey, 19–2% in upper storey and 2% in canopy; on Little Barrier I (*toititi*), 58–5% on ground, 34–6% in understorey, and 7–3% in subcanopy and canopy. On Snares I (*dannefaerdi*), most time (60%) spent less than 2 m from ground, with decreasing occurrence upwards at 2–1–4 m (27%), 4–1–6 m (10%) and above 6 m (3%). In pine plantations, 61% of feeding on or near ground, 11% at 1–5 m, 18% at 5–10 m, 10% above 10 m. In one study on Rangitira I, most prey taken from ground (65%), less from bark (10%) and foliage (13%) and in air (7%); in another study on same island, much more in vegetation, i.e. trees (38–5%), branches (15–4%), twigs (26%), vines (13–5%), foliage (1%), ground litter (5–8%). On Little Barrier I, prey taken from ground (52–4%), trunk (6–1%), branches (13–7%), twigs (4–2%), leaves (19–3%), air (4–2%); on Snares I, from ground (15%), tree trunk (20%), branch (42%), twigs (20%), foliage (less than 1%). In pine plantation, most prey attacked on ground (60%), fewer on trunks (10%), branches/cones (7%) and needles (16%) and in air (1%). Regardless of whether on large or on small island, generally uses similar attack methods: pounce on ground or sally-strike (84–93%), glean (2–12%), hover (0–1%), aerial sally (3–5%). When gleaning on ground, picks visible prey from surface; does not turn leaves.

**Breeding.** Breeds September on North I, Sept to late Dec on South I and Oct–Dec on offshore islands; usually two or three broods in season, and up to six attempts if failures occur. Breeds as monogamous pair. Territorial throughout year, territory defended by both sexes. Courtship display involves male chasing female with wings held high and forwards, or partners facing each other while flapping both wings alternately, male leads female during courtship, nest-building and incubation. Nest built by female, a cup of moss, leaves, rootlets, grass and bark, bound externally with spider web, lined with fine grass, feathers, fur and tree-fern scales, external diameter 10–12 cm, height 7–6 cm, internal diameter 5–7–6–5 cm, depth 3–8–4 cm; placed 1–18 m (usually 1–4 m) from ground in situation providing shelter along sides and sometimes above, such as cavity in tree or stump, tangle of vines, behind loose bark, or under crown of tree-fern; nestboxes accepted; territory 1–2–5 ha, on Snares a third or half of this size. Clutch 2–6 eggs (usually 3–4) on North I and South I, 1–4 (mostly 3) on Chathams and 2–3 (mostly 3) on Snares, creamy white, with yellowish-pink, lilac, blue and grey spots forming dense streak towards larger end, size variable, 17–27 × 14–7 mm on North I, 18–2 × 14–9 mm on South I, 19–1 × 15 mm on Chatham Is, 20 × 15–2 mm on Snares, 23 × 16–5 mm on Auckland; incubation by female, rarely assisted by male, period 15–17 days on North I and South I, but 17–18 days on Chathams and possibly 18–20 days on Snares;

young hatch mostly naked, down appearing on day 3, down-covered by day 5; chicks brooded by female, fed by both sexes, nestling period 17–20 days on North I, 20 days on South I and 16–19 days on Chathams; adult performs distraction display on ground, holding wings spread and raised and tail fanned while moving with jerky actions; fledglings led by both sexes for c. 10 days after leaving nest (or by male alone if female renests immediately) and by male for a further 1–2 weeks, disperse 5–6 weeks after reaching independence. Nests parasitized by Long-tailed Koel (*Eudynamis tenebris*). Success quite variable: in some areas most nests attacked by predators, e.g. black rat (*Rattus rattus*) and Long-tailed Koel; success 80% or more in those areas where predators controlled. May breed at end of first year of life.

**Movements.** Adults mainly sedentary, with some small-scale local or altitudinal movements; in some localities shifts to more open areas after breeding, elsewhere present throughout year. Juvenile dispersal of up to 16 km recorded. Species' dispersal capabilities demonstrated by recolonization of Mangere I and sporadic occurrences on Little Mangere I, in Chatham Is. One individual translocated to an island returned 56 km to its original site.

**Status and Conservation.** Not globally threatened. Locally common. Initial decline, owing to clearance of habitat and introduced predators after arrival of Europeans, appears to have stabilized, as the species adapts to modified conditions. Removal of undergrowth by livestock on islands inhibits its presence. Will use logged forest, but in lower densities than in unlogged areas. Major predators of this species are cats, black rats and common brushtail possum (*Trichosurus vulpecula*); control measures have increased breeding success, but there is some poisoning of this petroicid by bait intended for predators and, secondarily, by poisoned invertebrates. Readily adopts nestboxes erected in native forest.

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## 37. Red-capped Robin

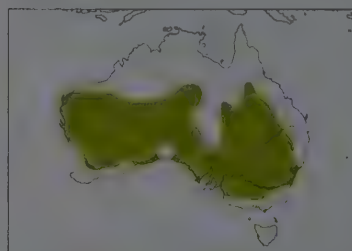
*Petroica goodenovii*

**French:** Miro à front rouge **German:** Rotstirnschnäpper **Spanish:** Petroica Frenতিরোজ  
**Other common names:** Red-capped Robin-flycatcher, Red-throated Robin

**Taxonomy.** *Muscicapa goodenovii* Vigors and Horsfield, 1827, South Australia, Australia.

Allied to the group formed by *P. boodang*, *P. multicolor* and *P. macrocephala*. Has been recorded as hybridizing with first of those three. Monotypic.

**Distribution.** S two-thirds of mainland Australia, with irregular occurrence of non-breeders in N parts and on much of E coast.



**Descriptive notes.** 10.5–12.5 cm; 7–9 g. Male has head, neck and upperparts black, large scarlet forehead patch; upperwing black, white median and greater secondary coverts, small white patch towards base of inner primaries and outer secondaries and white edges of outermost tertial and inner secondaries (forming broad elongate patch/stripe on folded wing extending posteriorly from near bend of wing, also narrow stripe on edges of secondaries; prominent wingstripe in flight); tail black, outer two feather pairs with outer web white, outermost pair with white also on edge of inner web; throat black, breast and centre of upper belly scarlet, remainder of underparts white; iris dark brown; bill and legs black. Female has head, neck and upperparts light grey-brown, forehead variable but usually with dull red wash; upperwing dark brown, pale patch towards base of inner primaries and outer secondaries (forming patch on folded wing, stripe in flight), slight off-white edges on outer secondaries (obscure line on folded wing), tail as male except that black replaced with dark brown; underparts off-white, pale grey-brown wash on side of breast or over entire breast, and sometimes a variable red wash over breast. Juvenile is pale-streaked brown above, off-white with brown mottling below, wing and tail as female; immature like female. Voice. Song a metallic insect-like "drit-drit-drr-it". Call a short "tick"; scold, harsh churring.

**Habitat.** Semi-arid and arid woodland and shrubland (mallee, mixed open woodland, mulga, etc.) with acacia (*Acacia*), eucalypt (*Eucalyptus*) and cypress pine (*Callitris*); occasionally in more mesic coastal regions, but generally avoids more humid areas and treeless regions.

**Food and Feeding.** Insects and other small arthropods. Most food caught on or near ground, primarily by pouncing from low perch, usually below 1 m. Foraging takes place mainly on ground (47–85%); bark of trunk and branches sometimes important (6–42%), but capture on foliage (2–13%) or in air (3–9%) much less so. In one study, fed on ground for 85% of time, much less at 0–1–1.5 m (9%), 1–5–3 m (4%), 3–4–5 m (2%) and above 4–5 m (less than 1%). Catches prey items mostly by pouncing (50–85% in various studies); gleaning occasionally important (3–38%), but other attack methods used far less often (aerial sally 1–9%, sally-strike 0–8%, hover 0–8%, probe 0–2%).

**Breeding.** Starts late Jan to mid Jan, rears up to four broods, and will make up to ten attempts, per season. Breeds as monogamous pair. Territory defended throughout year. Pair sedentary, where not sedentary, male occupies territory soon after arrival at breeding grounds. Male leads female throughout breeding season. Nest built by female, usually taking c. 7 days, a compact open cup of grasses, fine bark strips and rootlets, bound externally with spider web and often decorated with moss and lichen, lined with hair, fine grass and feathers; external diameter 5–7–6–4 cm, height 4–4–7 cm, internal diameter 2–9–3–8 cm, depth 2–5–3–8 cm; placed 0–3–9 m (usually 3–5 m) from ground in fork of tree or shrub; territory 0.25–0.5 ha. Clutch 2–3 eggs, occasionally 1, rarely 4, faint bluish-green, pale green or greyish-green, spotted and blotched with shades of brown and grey, with larger underlying purplish markings often forming cap at larger end; average size 18–20 × 12–6 mm, incubation by female, rarely assisted by male, period 12–16 days, usually c. 13–5 days; young hatch with sparse covering of down; chicks brooded by female, male rarely helping, fed by both parents, nestling period 12–17 days, usually 14 days; adults perform distraction displays near nest, move away from nest with wings lowered, or give broken-wing display, or flit nervously around intruder. Fledglings tended by both parents, remain in territory for up to 1–5 months. Nests parasitized by Pallid Cuckoo (*Cuculus pallidus*), Bush Cuckoo (*Cucumulus variolosus*), Black-eared Cuckoo (*Chrysococcyx osculans*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).



Hatching success 65–68% and fledging success 37–52%; predators include other avian species, particularly Grey Shrike-thrush (*Colluricincla harmonica*), Grey Butcherbird (*Cracticus torquatus*) and Australian Raven (*Corvus coronoides*). Greatest recorded longevity 5 years 7 months.

**Movements.** Extent and nature of movements poorly known. At least partly sedentary (present throughout year at many localities), more so in S of range. Elsewhere, local movements, also dispersive or migratory, mainly in winter months, when moves to more coastal areas or to lower altitudes; irregular non-breeding winter visitor to Kimberley and Pilbara, Northern Territory, N Queensland and coastal E New South Wales. Sexes may move at different times. Extent of movements not reflected in ringing data: all recoveries of marked individuals less than 10 km from site where originally ringed.

**Status and Conservation.** Not globally threatened. Common; irregular in wetter coastal districts. Widespread breeder in S Queensland, Western Australia and S states (but not recorded Tasmania); irregular non-breeding visitor in other areas.

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## 38. New Zealand Robin

### *Petroica australis*

**French:** Miro rubicole **German:** Langheinschnäpper **Spanish:** Petroica Neozelandesa  
**Other common names:** Bush Robin, New Zealand Robin-flycatcher; North Island Robin (*longipes*); South Island Robin (*australis*)

**Taxonomy.** *Turdus australis* Sparman, 1788, Dusky Sound, South Island, New Zealand.

This species and its melanistic insular relative *P. traversi* are sometimes placed in a separate genus, *Miro*. North I form, *longipes*, has been considered a separate species, and recent molecular work supports this split. Three subspecies currently recognized.

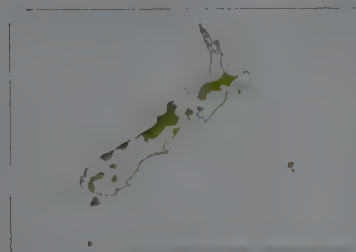
**Subspecies and Distribution.**

*P. a. longipes* (Lesson & Garnot, 1827) – N New Zealand: North I, Little Barrier I and Kapiti I.

*P. a. australis* (Sparman, 1788) – South I (S New Zealand).

*P. a. rakura* C. A. Fleming, 1950 – Stewart I, off S South I.

**Descriptive notes.** 18 cm; 33–47 g. Male nominate race has head, neck and upperparts sooty grey, black band separating base of upper mandible from small white frontal spot; narrow white eyering, ear-coverts with fine pale streaks; upperside brownish-black, concealed white patch near base of inner webs of secondaries and inner primaries, faint and ill-defined wingbar formed by pale grey area near base of outer webs visible on folded wing; tail sooty grey with brownish tinge; chin to upper breast slate-black with fine pale streaking, middle breast to undertail-coverts white, yellowish-white or cream, sharply demarcated from up-



per breast, dark grey sides of breast and belly and flanks, brownish-grey thighs; iris dark brown; bill and legs brownish-black, soles yellow. Female is similar to male, but upperparts, throat and flanks slightly paler. Juvenile is like female but slightly browner, with frontal spot reduced; immature difficult to separate from adult, but retains juvenile remiges and primary coverts (these feathers worn). Race *longipes* male has grey areas of head, upperparts and breast streaked whitish, reduced white on underparts, female usually paler than male; *rakura* has more extensive white on underparts. **Voice.** Song a series of phrases, each consisting of a number of identical notes uttered in variable sequence, staccato notes rise and fall in pitch, “tink tink tink tink tink tink tink tink tink”; 114 note types identified at one site, with average repertoire per individual 23.6 notes. Call a descending series of very loud notes used for advertisement, spacing or contact; contact call also “chuck”; aggressive call 3–20 loud “chuck” notes, starting rapidly and then slowing.

**Habitat.** Manuka (*Leptospermum*) and kanuka (*Kunzea*) scrub and forest, and *Nathofigus*-podocarp forest; also pine (*Pinus*) plantations on North I, occasionally gardens on S South I, and grazed vegetation if sufficient cover present. Often confined to gulleys or ridgetops. Sea-level to tree-line.

**Food and Feeding.** Invertebrates, including large cicadas (Cicadidae), caterpillars and large moths (Lepidoptera), beetles (Orthoptera) and stick-insects (Phasmida), earthworms (Oligochaeta), grubs, spiders (Araneae); occasionally berries. Smaller prey crushed between mandibles; larger items dismembered by being bashed on hard surface. Most foraging occurs within 2 m of ground. At Kōwhiri Bush (South I), 36.8% of perches used at 0.1–1 m, 33.5% at 1.2–2.1 m, 20.8% at 2.2–4.1 m, and 5.2% at or above 4.2 m. On small islands, feeds on ground 81–88% of time; flits among dead leaves, on trunks and among vines, less often in vegetation; occasionally in air. Much of prey obtained by pouncing or gleaning from leaf litter; in extensive study, 93% of food picked from ground, 7% gleaned from vegetation, and aerial flycatching insignificant (less than 0.01%). Does not turn leaves, taking only visible prey, which may be disturbed by foot-trembling and by flicking of wings and tail. Often catches food, usually in top of logs or among moss on branch, but uses variety of other sites, including stumps, holes and crevices. Does not join mixed-species foraging flocks.

**Breeding.** Egg-laying early May to late Mar (usually Sept–Jan); most pairs produce more than three clutches per season, and up to six recorded. Monogamous, often mates for life. Defends territory throughout year. Male feeds female throughout breeding season. Nest built by female, usually taking 1–7 days; a bulky cup of twigs, bark, grass, dead leaves and moss, bound externally with spider web, lined with tree fern leaves, moss and fine grass; external diameter 14 cm, height 10 cm, internal diameter 7.5 cm, depth 5 cm, placed up to 11 m (usually 5–8 m) from ground in fork of trunk or large branch or in cavity, occasionally on top of tree fern, or in vines or epiphytes; territory size 1–5 ha, usually 2–3 ha. Clutch 2–4 eggs, mostly 2–3, creamy white to greyish-cream, with fine spots and blotches of light brown or purplish-brown, often concentrated at larger end, average size 24.7 × 18.4 mm; incubation by female, period 17–20 days; chicks brooded by female, fed by both sexes, nestling period 19–22 days; noisy, retaining distraction display on ground, also pouncing on perches above head or ground, used by both sexes, young fed by both parents for 3–7 weeks after leaving nest; brood usually divided between parents if more than one fledgling; female may reuse 1–2 weeks after young fledged, and male alone then continues to feed fledglings until next brood hatches. Nest parasitized by *Leucophaea* (*Leucophaea* *hirsuta*). Success often poor, owing mainly to predation, but up to 89% success, where predation avoided, at Kōwhiri Bush (South I); 22% young fledged (1.4 fledglings per pair) with nest predators present, but 68.7%

fledged (3.8 fledglings per pair) when predators eradicated through poisoning programme; predators include mustelids, native and introduced rats, common brushtail possum (*Trichosurus vulpecula*), cats, Morepork (*Ninox novaezealandiae*). First breeding usually at 1 year (8–12 months), occasionally as early as 4–5 months on South I, but may be closer to 2 years on small islands.

**Movements.** Sedentary, present throughout year at some sites; young perform post-breeding dispersal. **Status and Conservation.** Not globally threatened. Common to scarce. On South I abundance irregular, and varies considerably with locality, habitat and altitude; on North I, no longer present in coastal areas; populations on Stewart I (on main island) isolated and disconnected, and species remains numerous only in large patches of manuka. Still abundant on small islands, including Green, Motonui, Jacky Lee, Poutama and Tamaiteioka. Declines are result of loss or degradation of habitat and introduced predators. Numbers reduced in logged forest, but will recolonize regenerated areas. Some individuals of present species fall victim to poisons put out for possums, but numbers increase when predator gone, with marked improvement in rates of breeding success.

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## 39. Black Robin

### *Petroica traversi*

**French:** Miro des Chatham **German:** Chathamsschnäpper **Spanish:** Petroica de las Chatham  
**Other common names:** Chatham (Black) Robin, Chatham Robin-flycatcher

**Taxonomy.** *Miro traversi* Buller, 1872, Chatham Islands, east of New Zealand. Sometimes placed with *P. australis* in a separate genus, *Miro*. Usually considered to be a melanistic insular derivative of that species, but recent molecular work inconclusive regarding this proposal. Monotypic.

**Distribution.** Chatham Is; Mangere I; introduced on Rangitira I.



**Descriptive notes.** 15 cm; 20–25.5 g. Plumage is completely dull black; iris dark brown; bill and legs black. Sexes alike. Juvenile is like adult, but with fine faint shaft streaks on head and underparts. **Voice.** Song a simple series of pure notes, individual repertoire 5–13 notes; total number of notes on Little Mangere I (1973/74) 48 notes. Contact call a single high-pitched note; also, aggressive “chuck” and descending series of notes.

**Habitat.** Forest and scrub, usually with closed canopy.

**Food and Feeding.** Invertebrates, mainly insects. Most prey obtained on ground, either by

pouncing from low elevated perch or by gleaning from leaf litter. In short study, individuals did 80% of feeding on ground, 5% at 0.1–10 m, 9% at 10–20 m, 6% above 20 m; fed from leaf litter (77%), bare ground (3%), branches and trunks (12%), foliage (5%), in air (3%); prey captured by being pounced on (57% of captures), gleaned (35%, including from leaf litter), in sally-strike (3%) and in flutter-chase (5%). Frequently moved between perches, 2–9 times per minute. In one set of observations, c. 85% of waking time spent in foraging.

**Breeding.** Season short, eggs Oct–Nov; usually one brood, but experienced pairs sometimes produce more. Territorial throughout year. In courtship, male chases female through trees; male feeds her during courtship and through incubation. Nest built by female, a cup constructed of twigs, bark and dry leaves, bound externally with spider web, lined with moss and feathers, placed usually below 10 m in cavity in hollow tree or in low stump buried in vine tangle, or, where these not available, in range of other situations, including on ground; territory size c. 0.7–2 ha. Clutch 1–3 eggs, usually 2, creamy white with purplish-brown spots and blotches, 22 × 17 mm; usually laid 8–12 days (but up to 1 month if weather inclement) after completion of nest; incubation by female, period 17–19 days; chicks brooded by female, fed by both parents, leave nest at 20–23 days; young fed by both adults for 3–6 weeks after fledging. Success good: can fledge three young, usually one or two; under active manipulation, female can produce four clutches in season (extending laying period to Jan), will readily accept replacement of eggs with nestlings. First breeding usually at 2 years, sometimes at 1 year. Longevity 10–12 years.

**Movements.** Sedentary.

**Status and Conservation.** ENDANGERED. Restricted-range species: present in Chatham Islands IBA. Global population in 2000 was c. 250 individuals. Before arrival of Europeans probably lived throughout Chatham Is, but human-related activities caused its extirpation on most islands. Known to have been present on Mangere I and Little Mangere I when first discovered, and possibly also on Chatham I and Pitt I before this, but no records. Around 1900, when cats had eliminated Mangere I population, only c. 25 pairs remained on Little Mangere I; here they were safe from predators, but extensive wind damage caused erosion, with loss of food and habitat, and by 1972 only 18 individuals left. By 1976 as few as seven remained; these were captured and moved to Mangere I, where, despite breeding attempts, no success. Numbers then dropped to five individuals, consisting of three males and two females; only one of the females bred, eventually producing eleven chicks in 4 years. In 1980/81 breeding season, eggs removed and cross-fostered in nests of Chatham Gerygone (*Gerygone olbofrontata*), the parent robins quickly re-laying; the gerygones, however, proved unsuitable foster-parents because of their slow feeding rate. In following season, *P. microcephala* on Rangitira I employed as biocontrol, with high success, in order to avoid importing young were returned to natural parents before fledging. In 1983, a new population of present species was established on Rangitira, to which two pairs of adults were translocated. Potential for genetic problems is being monitored. Introduced Common Starlings (*Sturnus vulgaris*) kill nesting birds and destroy eggs and chicks.

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1997j, 1997k, 1997l, 1997m, 1997n, 1997o, 1997p, 1997q, 1997r, 1997s, 1997t, 1997u, 1997v, 1997w, 1997x, 1997y, 1997z, 1998a, 1998b, 1998c, 1998d, 1998e, 1998f, 1998g, 1998h, 1998i, 1998j, 1998k, 1998l, 1998m, 1998n, 1998o, 1998p, 1998q, 1998r, 1998s, 1998t, 1998u, 1998v, 1998w, 1998x, 1998y, 1998z, 1999a, 1999b, 1999c, 1999d, 1999e, 1999f, 1999g, 1999h, 1999i, 1999j, 1999k, 1999l, 1999m, 1999n, 1999o, 1999p, 1999q, 1999r, 1999s, 1999t, 1999u, 1999v, 1999w, 1999x, 1999y, 1999z, 2000a, 2000b, 2000c, 2000d, 2000e, 2000f, 2000g, 2000h, 2000i, 2000j, 2000k, 2000l, 2000m, 2000n, 2000o, 2000p, 2000q, 2000r, 2000s, 2000t, 2000u, 2000v, 2000w, 2000x, 2000y, 2000z, 2001a, 2001b, 2001c, 2001d, 2001e, 2001f, 2001g, 2001h, 2001i, 2001j, 2001k, 2001l, 2001m, 2001n, 2001o, 2001p, 2001q, 2001r, 2001s, 2001t, 2001u, 2001v, 2001w, 2001x, 2001y, 2001z, 2002a, 2002b, 2002c, 2002d, 2002e, 2002f, 2002g, 2002h, 2002i, 2002j, 2002k, 2002l, 2002m, 2002n, 2002o, 2002p, 2002q, 2002r, 2002s, 2002t, 2002u, 2002v, 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2008j, 2008k, 2008l, 2008m, 2008n, 2008o, 2008p, 2008q, 2008r, 2008s, 2008t, 2008u, 2008v, 2008w, 2008x, 2008y, 2008z, 2009a, 2009b, 2009c, 2009d, 2009e, 2009f, 2009g, 2009h, 2009i, 2009j, 2009k, 2009l, 2009m, 2009n, 2009o, 2009p, 2009q, 2009r, 2009s, 2009t, 2009u, 2009v, 2009w, 2009x, 2009y, 2009z, 2010a, 2010b, 2010c, 2010d, 2010e, 2010f, 2010g, 2010h, 2010i, 2010j, 2010k, 2010l, 2010m, 2010n, 2010o, 2010p, 2010q, 2010r, 2010s, 2010t, 2010u, 2010v, 2010w, 2010x, 2010y, 2010z, 2011a, 2011b, 2011c, 2011d, 2011e, 2011f, 2011g, 2011h, 2011i, 2011j, 2011k, 2011l, 2011m, 2011n, 2011o, 2011p, 2011q, 2011r, 2011s, 2011t, 2011u, 2011v, 2011w, 2011x, 2011y, 2011z, 2012a, 2012b, 2012c, 2012d, 2012e, 2012f, 2012g, 2012h, 2012i, 2012j, 2012k, 2012l, 2012m, 2012n, 2012o, 2012p, 2012q, 2012r, 2012s, 2012t, 2012u, 2012v, 2012w, 2012x, 2012y, 2012z, 2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2013g, 2013h, 2013i, 2013j, 2013k, 2013l, 2013m, 2013n, 2013o, 2013p, 2013q, 2013r, 2013s, 2013t, 2013u, 2013v, 2013w, 2013x, 2013y, 2013z, 2014a, 2014b, 2014c, 2014d, 2014e, 2014f, 2014g, 2014h, 2014i, 2014j, 2014k, 2014l, 2014m, 2014n, 2014o, 2014p, 2014q, 2014r, 2014s, 2014t, 2014u, 2014v, 2014w, 2014x, 2014y, 2014z, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2015g, 2015h, 2015i, 2015j, 2015k, 2015l, 2015m, 2015n, 2015o, 2015p, 2015q, 2015r, 2015s, 2015t, 2015u, 2015v, 2015w, 2015x, 2015y, 2015z, 2016a, 2016b, 2016c, 2016d, 2016e, 2016f, 2016g, 2016h, 2016i, 2016j, 2016k, 2016l, 2016m, 2016n, 2016o, 2016p, 2016q, 2016r, 2016s, 2016t, 2016u, 2016v, 2016w, 2016x, 2016y, 2016z, 2017a, 2017b, 2017c, 2017d, 2017e, 2017f, 2017g, 2017h, 2017i, 2017j, 2017k, 2017l, 2017m, 2017n, 2017o, 2017p, 2017q, 2017r, 2017s, 2017t, 2017u, 2017v, 2017w, 2017x, 2017y, 2017z, 2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2018h, 2018i, 2018j, 2018k, 2018l, 2018m, 2018n, 2018o, 2018p, 2018q, 2018r, 2018s, 2018t, 2018u, 2018v, 2018w, 2018x, 2018y, 2018z, 2019a, 2019b, 2019c, 2019d, 2019e, 2019f, 2019g, 2019h, 2019i, 2019j, 2019k, 2019l, 2019m, 2019n, 2019o, 2019p, 2019q, 2019r, 2019s, 2019t, 2019u, 2019v, 2019w, 2019x, 2019y, 2019z, 2020a, 2020b, 2020c, 2020d, 2020e, 2020f, 2020g, 2020h, 2020i, 2020j, 2020k, 2020l, 2020m, 2020n, 2020o, 2020p, 2020q, 2020r, 2020s, 2020t, 2020u, 2020v, 2020w, 2020x, 2020y, 2020z, 2021a, 2021b, 2021c, 2021d, 2021e, 2021f, 2021g, 2021h, 2021i, 2021j, 2021k, 2021l, 2021m, 2021n, 2021o, 2021p, 2021q, 2021r, 2021s, 2021t, 2021u, 2021v, 2021w, 2021x, 2021y, 2021z, 2022a, 2022b, 2022c, 2022d, 2022e, 2022f, 2022g, 2022h, 2022i, 2022j, 2022k, 2022l, 2022m, 2022n, 2022o, 2022p, 2022q, 2022r, 2022s, 2022t, 2022u, 2022v, 2022w, 2022x, 2022y, 2022z, 2023a, 2023b, 2023c, 2023d, 2023e, 2023f, 2023g, 2023h, 2023i, 2023j, 2023k, 2023l, 2023m, 2023n, 2023o, 2023p, 2023q, 2023r, 2023s, 2023t, 2023u, 2023v, 2023w, 2023x, 2023y, 2023z, 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g, 2024h, 2024i, 2024j, 2024k, 2024l, 2024m, 2024n, 2024o, 2024p, 2024q, 2024r, 2024s, 2024t, 2024u, 2024v, 2024w, 2024x, 2024y, 2024z, 2025a, 2025b, 2025c, 2025d, 2025e, 2025f, 2025g, 2025h, 2025i, 2025j, 2025k, 2025l, 2025m, 2025n, 2025o, 2025p, 2025q, 2025r, 2025s, 2025t, 2025u, 2025v, 2025w, 2025x, 2025y, 2025z, 2026a, 2026b, 2026c, 2026d, 2026e, 2026f, 2026g, 2026h, 2026i, 2026j, 2026k, 2026l, 2026m, 2026n, 2026o, 2026p, 2026q, 2026r, 2026s, 2026t, 202





PLATE 40

inches 2  
cm 5

## PLATE 40

## Genus *MICROECA* Gould, 1841

### 40. Yellow-legged Flyrobin

#### *Microeca griseiceps*

**French:** Miro à pattes jaunes **German:** Gelbfußschnäpper **Spanish:** Petroica Patigualda  
Other common names: Yellow/Little Yellow Robin/Flycatcher, Yellow-legged Flycatcher, Yellow-footed (*Microeca*) Flycatcher, Grey-headed Flycatcher-robin

**Taxonomy** *Microeca griseiceps* De Vis, 1894, Mount Maneao, south-east New Guinea.

Three subspecies are recognized.

#### Subspecies and Distribution

*M. g. occidentalis* Rothschild & E. J. O. Hartert, 1903 – New Guinea mountains (Vogelkop and E to Victor I-manuel Range, Sepik Mts and Adelbert Mts).

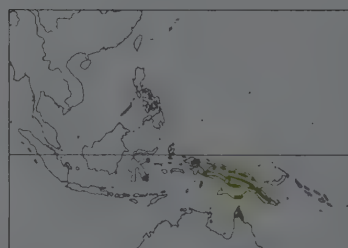
*M. g. griseiceps* De Vis, 1894 – S & SE New Guinea (lowlands of S Trans-Fly region; Herzog Mts and mountains of SFL).

*M. g. kempi* (Mathews, 1913) – N Queensland (NE Cape York Peninsula), in N Australia.

**Descriptive notes** 12–13 cm, 10–12 g. Nominata race has crown, side of head and hindneck grey, spot in front of eye and eyering olive; upperparts olive-green, upperwing and tail dark brown, rectrices narrow, edged olive-brown, chin to upper breast off-white, remainder of underparts straw-yellow, upper breast with pale brownish wash, iris dark brown, upper mandible black, lower mandible cream-yellow, legs bright orange-buff. Sexes similar. Juvenile has upperpart feathers tipped buff, underwing coverts with pale tips, underpart feathers tipped dark, immature similar to adult, except for pale-tipped secondary coverts. Race *occidentalis* has crown darker and browner than nominate, upperparts darker, *kempi* much paler. Voice: Song a loud clear whistle, repeated 5–10 times, some notes trilled. Call while foraging a low piping or hissing “zzt zzt zzt”; also, prolonged “trew, joei, joei, joei” and a chattering call.

**Habitat** In New Guinea, found in primary forest, tall secondary forest, forest edge and partly cleared areas with regrowth, mainly on hills and lower mountains at 550–1400 m, but rarely up to 2300 m, locally in lowlands in Trans-Fly region, sometimes only in narrow zone around 1200 m.

## Family PETROICIDAE (AUSTRALASIAN ROBINS) SPECIES ACCOUNTS



At lower elevations usually replaced by *M. flavovirescens*, at higher altitudes by *M. papuana*, sometimes with wide overlap. In Australia (race *kempi*) inhabits rainforest and its edges, extending as much as 50 m into adjacent eucalypt (*Eucalyptus*) and paperbark (*Melaleuca*) forest, monsoon forest; avoids denser sections of forest. Vagrant on Aru Is recorded in mangroves.

**Food and Feeding.** Insects and other small arthropods. Forages mainly in upper canopy, sometimes ranging down to middle stages. Prey captured by aerial sallying (to up to 6 m above canopy); sometimes obtained by sally-striking

at foliage. Sometimes joins mixed-species flocks with other small insectivores.

**Breeding.** In New Guinea, laying female in Oct, young being fed in Dec and juveniles in Jan–Mar, suggesting breeding in at least Oct–Jan, encompassing late dry season and early wet season, and perhaps also end of wet season (report of nest in May possibly erroneous); in Australia probably Feb–Nov–January, in wet season. Nest a small neat cup of rootlets, bound with spider web and decorated with pieces of bark and lichen, external diameter 3–8 cm, height 4 cm, internal depth 2 cm; placed 6–30 m from ground on horizontal branch. Clutch 2 eggs, pale blue, with dark brown and grey specks all over (mainly at larger end), 15 × 12 mm; adults observed to perform incubation in bouts of 4–7 minutes, with about same time off nest. No other information.

**Movements.** No indications of movement in Australia; regarded as resident at several sites in New Guinea. Recorded as vagrant in Aru Is, S of W New Guinea.

**Status and Conservation.** Not globally threatened. Generally scarce in New Guinea, but inconspicuous and easily missed. Uncommon to scarce in Australia; reports from farther S in Queensland, in vicinity of Coen and Atherton Tableland, require corroboration.

**Bibliography.** Barrett *et al.* (2003), Bechler (1978a, b), Boies (1980, 1983b, 1988), Bourke & Austin (1947), Clapp (1987), Coates (1990), Croxall (1977), Diamond & Bishop (1994), Gilliard & LeCroy (1961b), Hartert (1930), Higgins & Peier (2002), Iredale (1956), Layton & Donaghey (1969), Macgillivray (1918), Mayr & Rand (1937), McAllan (1990), Nagle (1987), Noske & Stricklen (1979), Officer (1969), Ogilvie-Grant (1915), Opi (1975), Rand (1942a, 1942b), Rand & Gilliard (1967), Rothschild & Hartert (1903c), Schodde & Mason (1999), Vaurie (1953a).

## 41. Canary Flyrobin

### *Microeca papuana*

**French:** Miro papou **German:** Papuaschnäpper **Spanish:** Petroica Papú  
**Other common names:** Canary/Montane Flycatcher, Papuan Flyrobin, Yellow (Microeca) Flycatcher, Yellow-breasted Flycatcher-robin

**Taxonomy.** *Microeca papuana* A. B. Meyer, 1875, Arfak Mountains, New Guinea. Monotypic.

**Distribution.** Mountains of New Guinea.



**Descriptive notes.** 11.5–13 cm. 13–16 g. Has crown, face and upperparts yellowish olive-green, remiges olive-brown, median and lesser upperwing-coverts yellowish olive-green; tail olive-brown; throat side and underparts yellow, chin paler, belly and flanks with slight olive wash; iris dark brown; bill black; legs orange-yellow. Sexes similar. Juvenile is heavily spotted with pale buff or cream; immature similar to adult, but with retained pale-tipped juvenile wing-coverts. Voice. Song described variously as high tinkling descending warble and as jumble of high twitterings and warbles. Also emits high-pitched “tsee”, faint sibilant

upslur, and repeated scolding note on one pitch.

**Habitat.** Mountain forest, forest edge and small clearings, mainly at 1800–2500 m, locally down to 1100 m and up to 3500 m.

**Food and Feeding.** Insects, including weevils and other beetles (Coleoptera) and hymenopterans. Forages in middle storey (20%), lower storey (50%) and understorey (30%). Food obtained mainly by aerial flycatching (90%), occasionally by sally-striking (10%). Usually moves to different perch after each sally.

**Breeding.** Few data. Adults in breeding condition in Dec, individual sitting on nest in early Apr, and fledglings in early Feb to mid-Feb, indicating that breeding apparently mainly or only in wet season. Nest a small, neat cup placed 10 m from ground on horizontal branch of sapling without nearby concealing foliage; adults observed accompanied by two or more fledglings. No other information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Moderately common in most localities at suitable elevation; sometimes scarce.

**Bibliography.** Beehler (1978b), Coates (1990), Croxall (1977), Diamond (1972), Finch (1981a), Gilliard & LeCroy (1961b), Greenway (1935), Gyldenstolpe (1955a), Iredale (1956), Mayr & Rand (1937), Ogilvie-Grant (1915), Salvadori (1881), Vaurie (1953a).

## 42. Lemon-bellied Flyrobin

### *Microeca flavigaster*

**French:** Miro à ventre citron **German:** Gelbbrustschnäpper **Spanish:** Petroica Limón  
**Other common names:** Lemon-bellied Flycatcher, Yellow-bellied/Yellow-breasted Flycatcher/Flyrobin, Lemon-breasted Microeca/Flycatcher/Flycatcher-robin; Brown-tailed/Kimberley Flycatcher/Flyrobin (*tormenti*)

**Taxonomy.** *Microeca flavigaster* Gould, 1843, Port Essington, Northern Territory, Australia. Possibly closest to *M. hemixantha*, which is regarded by many as a brighter island representative of present species. Race *tormenti* formerly treated as a separate species, but allegedly intergrades with nominate on E boundary of range; in view of differences in plumage and habitat preferences between the two, however, taxonomic relationship between them merits reinvestigation. Proposed race *terraereginae*, described from Cairns, in N Queensland (Australia), is based on what is considered an indeterminate specimen that appears intermediate between populations to N and to S of it. Six subspecies currently recognized.

**Subspecies and Distribution.**

*M. f. laeta* Salvadori, 1878 – N New Guinea: Wandammen, W coast of Geelvink Bay, Victor Emanuel Mts and Astrolabe Bay region.

*M. f. tarara* Rand, 1940 – coast of SW New Guinea (S from R Mimika to R Wassi Kussa).

*M. f. flavissima* Schodde & Mason, 1999 – SE New Guinea, islands in Torres Strait and NE Australia (Cape York Peninsula).

*M. f. tormenti* Mathews, 1916 – NW Australia: coastal N Western Australia (King Sound E to Napier Broome Bay).

*M. f. flavigaster* Gould, 1843 – NC Australia: N Northern Territory.

*M. f. laetissima* Rothschild, 1916 – NE Australia (Cairns district of NE Queensland).



**Descriptive notes.** 12.5–14.5 cm; 11–14 g. Nominant race is olive-brown above, rump slightly darker, with narrow dusky loreal stripe, narrow diffuse off-white supercilium, white broken eyering above and below eye. Greyish-brown ear-coverts; upperwing dark brown, narrower pale edges on wing-coverts and basal primaries, somewhat broader edging on secondaries and tertiaries; tail dark olive-brown, rectrices narrowly edged olive; chin and throat white, underparts lemon-yellow, slight pale grey wash on side of breast; iris dark brown; bill black, pale base of lower mandible; legs dark grey. Sexes similar. Juvenile has pale spots

on tips of feathers of upperparts and wing-coverts, underpart feathers tipped olive-brown, bill and legs lighter than adult; immature similar to adult, but with pale-tipped juvenile wing-coverts. Race *laetissima* is somewhat brighter than nominate; *flavissima* is much yellower than both; *tarara* is like previous, but darker above and paler below; *laeta* is similar to last but yellower overall, with darker bill; *tormenti* is distinctive, lacks yellow tones in plumage, is grey-brown above, back and

rump washed olive, wing dark brown, secondaries edged white, wing-coverts grey-brown with olive wash, tail dark brown, whitish spot on inner webs of outer three pairs of rectrices, buff-grey below, belly whiter. Voice. Song a series of rich and varied clear whistles, repeated “pa-treeter” or “peter peter”; sometimes written as “chew-chew-sweet-so-wu-chew”, “do be sweet, to Cynthia” or “quick, quick, come with me, tito”; can be given in song flight resembling that of larks (Alaudidae). Call a bouncy “chauncey chauncey chew”. In New Guinea, also short monotone whistle followed by similar but higher syllable and rapid series of c. 8 short descending notes; contact call is a sharp “k chip”.

**Habitat.** In New Guinea inhabits eucalypt (*Eucalyptus*) savanna, open woodland and mangroves, also rubber plantations, in lowlands and hills to c. 670 m, and locally in upland valleys (1100 m in Wau Valley; 1460 m at Telefomin). In Australia occurs at lower altitudes, in Queensland mainly in open tropical forest and woodland, often bordering wet forest, also paperbark (*Melaleuca*) forest; in Northern Territory in monsoon forest and mangroves, occasionally eucalypt forest and woodlands; confined to mangroves in Western Australia.

**Food and Feeding.** Insects and other small arthropods. Forages at all levels, but mostly above 4 m. In mangroves, feeds at all levels from ground to canopy, but mostly on trunk and in air. In eucalypt woodland and monsoon forest, 5% of recorded foraging was on ground, 10% above it to below 1 m, 12% at 2–3 m, 24% at 4–7 m, 29% at 8–14 m, 20% above 14 m. Foraged on ground 5% of time, on trunks and branches 12%, on foliage in shrubs 3%, in inner foliage of tree 12%, in outer foliage of tree 44%, in air 24%. In one study, obtained prey by gleaning (2%), flutter-chasing (12%), sally-strikes (62%) and aerial flycatching (21%).

**Breeding.** Recorded in all months in Australia, main peak Sept (smaller peak Dec–Jan) in Queensland, Feb–Oct (peaks Mar–Apr and Aug–Oct) in Northern Territory, and eggs in Oct–Dec in Western Australia; in New Guinea, eggs in early Mar to Apr and Aug–Dec and juveniles in mid-Feb, thus breeding mainly during latter part of dry season, with some also in middle to late wet season.

Territorial throughout year; male has lark-like song flight. Nest a very small, shallow cup made of grass and bark fibre, bound with spider web, decorated on exterior with bark and lichen; built on horizontal fork or near end of bare or dead branch 0.6–20 m (usually c. 7.5 m) from ground, in mangroves 0.6–2.4 (usually c. 1.5 m) above water. Clutch 1 egg in Australia, 1–2 in New Guinea, bluish-white, spotted and blotched all over with browns and purple, average size 18.8 × 13.8 mm (nominate race), 16 × 12.4 mm (*tormenti*); no information on incubation and fledging periods; both adults feed fledglings. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*).

**Movements.** Apparently sedentary; present at sites throughout year. Few recoveries of marked individuals, but all within 10 km of site where originally ringed.

**Status and Conservation.** Not globally threatened. Fairly common to common in most of range; uncommon in Western Australia (race *tormenti*). Average population density in an area of coastal hill savanna at Port Moresby, in SE New Guinea (race *flavissima*), 2.7 birds/10ha.

**Bibliography.** Barrett *et al.* (2003), Bell (1982c, 1982e), Boles (1988), Campbell (1901, 1902), Clapp (1979, 1980), Coates (1990), Diamond & Bishop (1994), Galbraith (1974a), Gilliard & LeCroy (1961b), Higgins & Peter (2002), Iredale (1956), Jenkins (1946), Johnstone (1984, 1990), Johnstone & Storr (2004), Keast (1958b, 1985), Le Souëf (1902), Lendon (1966), Mason (1977), Mathews (1920a), McCarthy (2006), Mees (1982), North (1903), Noske (1996), Officer (1969), Parker (1973), Rand (1940b), Rix (1970), Salvadori (1881), Schodde & Mason (1999), Selby (1946), Seyfort (1974), Vaurie (1953a), White (1915).

## 43. Tanimbar Flyrobin

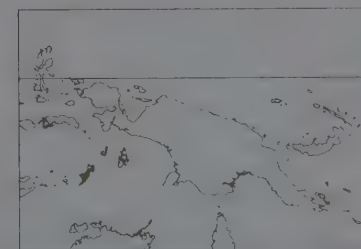
### *Microeca hemixantha*

**French:** Miro des Tanimbar **German:** Tanimbarschnäpper **Spanish:** Petroica de las Tanimbar  
**Other common names:** Gold(en)-bellied Flycatcher/Flyrobin, Tanimbar (Microeca) Flycatcher

**Taxonomy.** *Microeca hemixantha* P. L. Slater, 1883, Tanimbar Island.

Possibly closest to *M. flavigaster*, and regarded by many as a brighter island representative of that species. Monotypic.

**Distribution.** Tanimbar Is (Larat, Yamdena).



**Descriptive notes.** 12 cm. Has rather ill-defined yellow supercilium stretching from base of bill to behind eye, dusky ear-coverts; crown and upperparts, including upperwing and tail, darkish olive; bright yellow on underparts, with throat somewhat paler; iris dark brown; upper mandible black, lower mandible light pinkish-orange; legs black. Sexes alike. Juvenile undescribed, presumably with contrasting pale tips of feathers. Voice. Song is a series of 12–14 sweet warbling notes; occasionally a higher-pitched version of this.

**Habitat.** Mangroves, forest, forest edge and open woodland; in lowlands.

**Food and Feeding.** Insects. Frequents middle storey, seldom below 10 m. Prey captured in short flights from exposed perch. May join mixed-species foraging flocks.

**Breeding.** No information available.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Banda Sea Islands EBA. Common within very small range, but substantial logging occurs in parts of it. Likely to be sensitive to habitat loss and degradation.

**Bibliography.** Anon. (2006c), Bishop & Brickell (1999), Butchart & Stattersfield (2004), Coates & Bishop (1997), Collar *et al.* (2001), Slater (1883b), Stattersfield & Capper (2000), Vaurie (1953a), White & Bruce (1986)

## 44. Olive Flyrobin

### *Microeca flavovirescens*

**French:** Miro olive **German:** Aruschnäpper **Spanish:** Petroica Olivácea  
**Other common names:** Olive-yellow/Olive Flycatcher, Olive Microeca (Flycatcher), Orange-chinned Flyrobin, Pale Yellow Flycatcher-robin

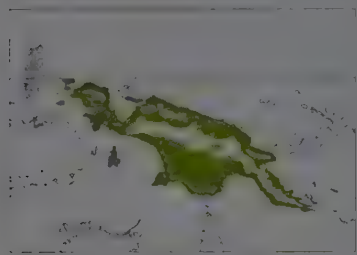
**Taxonomy.** *Microeca? flavovirescens* G. R. Gray, 1858, Aru Islands. Two subspecies recognized.



**Subspecies and Distribution.**

*M. f. cuicui* (De Vis, 1897) – West Papuan Is (Waigeo, Batanta, Misool), Yapen I and mainland New Guinea (except for mountains and Trans-Fly region).

*M. f. flavovirescens* G. R. Gray, 1858 – Trans-Fly region of New Guinea (between R. Wassi Kussa and R. Fly), and Aru Is.



**Descriptive notes.** 13–14 cm; 14–17 g. Nominate race has crown, side of head and upperparts dull olive-green, eyering light yellow; upperwing and tail dark olive-brown; light olive-yellow below, flanks with olive wash; iris dark brown; upper mandible dark dusky brown, lower mandible pale yellow or orange-yellow; legs dull yellow or pale brown. Sexes similar. Juvenile has pale tips of feathers, including upperwing-coverts; immature similar to adult, but retains juvenile wing-coverts. Race *cuicui* has upperparts brighter and underparts deeper yellow than those of nominate.

**VOICE.** Song a rapid series of falling and then rising disyllabic musical whistles, “ululululululul...”, delivered monotonously. Also has a rather quiet whistled note repeated 3–5 times or more, a scolding chatter of repeated harsh nasal notes, also an unmusical “sweet” like sound made by a rusty hinge.

**Habitat.** Rainforest, monsoon forest, sometimes teak (*Tectona*) plantations, occasionally foraging out into nearby open areas; mainly in lowlands and lower hills, locally to 1200 m, rarely to 1500 m. Usually replaced in hills by *M. griseiceps*, often with considerable altitudinal overlap.

**Food and Feeding.** Insects. Feeds mostly in middle storey (50%), less in lower storey (35%) and understorey (15%). Prey captured mainly by sally-striking (c. 50%) and aerial flycatching (c. 30%), with some gleaning and hovering. Sometimes joins mixed-species foraging flocks.

**Breeding.** Adults in breeding condition in Jun–Aug, egg-laying in SE New Guinea (Port Moresby lowland) in May–Nov, and juvenile in early Jun, implying commencement of breeding at end of wet season and continuing throughout dry season. Nest a small cup of moss, bound with cobweb, lined with hair, placed 1.5–12 m from ground on horizontal branch of sapling or small tree with no nearby foliage. Clutch 2 eggs. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Fairly common to very common. Population density in a rainforest study site near R. Brown, in SE New Guinea, was estimated to be c. 20 birds/10 ha.

**Bibliography.** Beecher (1978b), Bell (1982b), Coates (1990), Croxall (1977), Diamond (1972), Hartert *et al.* (1936), Iredale (1956), Mayr & Rand (1937), Ogilvie-Grant (1915), Rand (1942a), Rothschild & Hartert (1903c), Salvadori (1881), Stein (1936).

**45. Jacky Winter***Microeca fascians*

**French:** Miro enchanteur **German:** Weißschwanzschnäpper **Spanish:** Petroica Fascinante  
**Other common names:** Australian Brown Flycatcher, Allied/Brown/Lesser Brown Flycatcher

**Taxonomy.** *Loxia fascians* Latham, 1801, Sydney, New South Wales, Australia.

Species was for long referred to as *M. leucophaea*, as current name erroneously assumed to be based on an early painting that was indeterminate. Nominant race and *assimilis* intergrade in SE Australia; intermediate individuals described as race *barcoo* (based on specimen from E. South Australia). Four subspecies recognized.

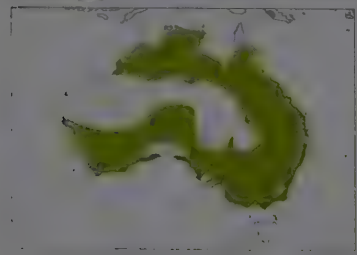
**Subspecies and Distribution.**

*M. f. zimmeri* Mayr & Rand, 1935 – SE New Guinea (from Bereina S to Port Moresby).

*M. f. pallida* De Vis, 1884 – N Australia from N Western Australia E to W Queensland.

*M. f. assimilis* Gould, 1841 – SW. C & S Australia E to mallee country of Victoria.

*M. f. fascians* (Latham, 1801) – E & SE Australia S from E & C Queensland (S from Cairns district) and E from W New South Wales and Adelaide district of South Australia.



**Descriptive notes.** 12.5–14 cm; 14–20 g. Nominant race has diffuse whitish supercilium, narrow black stripe from lores to behind eye, white eyering; crown, face, neck and upperparts grey-brown, upperwing dark brown with faint paler suffusion on remiges, upperwing-coverts grey-brown; tail dark brownish-black, central feather pair narrowly tipped white, amount of white at tip increasing outwards on rectrices T2–T4, outer two pairs entirely white; chin, throat and underparts off-white, breast side and flanks washed brownish-grey; iris dark brown; bill and legs very dark brown. Sexes similar. Juvenile is grey-brown above with feathers

tipped off-white, underparts off-white with brown feather tips; immature as adult but retains pale-tipped primary coverts. Race *assimilis* has white in tail restricted to distal half of outermost rectrix and does not reach greater of adjacent one, *pallida* is paler than others, with more pronounced white on lores and supercilium; *zimmeri* has upperparts and underparts washed yellow. **VOICE.** Song a five-note “peto-peto”, repeated often. Call a pair of pleasant loud whistled notes, the first three tones lower than the second, given three or more times with no pauses, “pretty-pretty-pretty”. An accomplished mimic.

**Habitat.** *assimilis* (neot-pts): woodland, mallee and other dry, lightly timbered scrublands, particularly with open shrubby and clear spaces; also ecotones between timbered and cleared land, grassy paddocks, urban parks and gardens. In New Guinea (race *zimmeri*) inhabits eucalypt savanna in lowland.

**Food and Feeding.** Insects, spiders (Araneae), worms (Oligochaeta) and other small invertebrates. Prey captured mainly on ground or in air; techniques are pounce to ground from perch (66%),

aerial flycatching (26%) and sally-striking (8%). Sometimes joins mixed-species flocks; often associates with Kestless Flycatcher (*Micropus iniquus*) and Willie Wagtail (*Rhipidura terraephila*).

**Breeding.** In Australia Aug–Jan, or in arid areas after rain, and one or two broods per season; in New Guinea, fledged young from mid Oct to late Jan indicating breeding in late dry season, otherwise nesting habits in New Guinea undescribed. Breeds as pair, occasionally with helpers, up to three of which observed at single nest. Presumed male performs song flight like that of a lark (Alaudidae), to 120–150 m in air. Nest built by female, a small shallow cup of grass, bark strips and rootlets, bound with spider web, sometimes with bark attached to outside, lined with fur, bark, feathers and lichen, external diameter 5.1–7 cm, height 2.9–3.8 cm, internal diameter 3.7–4.8 cm, depth 1.5–1.9 cm; placed 1–18 m (mostly c. 5 m) above ground, generally in exposed fork of horizontal branch, usually a dead one. Clutch 1–3 eggs, usually 2, light grey-blue or blue-green with spots and blotches of reddish-brown and underlying lavender, average size 19.9 × 14.3 mm; incubation by female, period 16–18 days; nestlings brooded apparently by female, fed by both parents, leave nest at 17–20 days; adult performs injury-feigning distraction display; young fed by both parents for 10–15 days after leaving nest. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*), Pallid Cuckoo (*Cuculus pallidus*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Hatching success 25–52%; fledging success often quite low, c. 9%. Greatest recorded longevity 5 years 3 months.

**Movements.** Some movements reported, but nature and extent of these not known. In many areas present throughout year; elsewhere, limited seasonal shifts to more open areas. Longest movement of marked individual less than 10 km from site of original ringing.

**Status and Conservation.** Not globally threatened. Common to rather scarce. In Australia, common in most of range, less so in N. Declining around denser human habitation and in areas cleared for agriculture. In New Guinea, generally scarce and local, and absent from many areas within distributional limits; was apparently common around Port Moresby during 1943, suggesting that a decline in numbers has occurred in recent years.

**Bibliography.** Barrett *et al.* (2003), Bell (1982c), Boehm (1956), Boles (1985), Campbell (1901), Coates (1990), Ford (1971a), Hanks (1928), Higgins & Peter (2002), Iredale (1956), Johnstone & Storr (2004), Keast (1958b, 1985, 1994c), Marchant (1985c), Mathews (1920a), McCarthy (2006), North (1903), Officer (1969), Recher & Davis (1998), Recher *et al.* (2002), Schodde (1992), Schodde & Mason (1999), Sedgwick (1950), Serventy & Whittell (1976), Tubb (1945).

**Genus MONACHELLA** Salvadori, 1874**46. Torrent Flyrobin***Monachella muelleriana*

**French:** Miro des torrents **German:** Uferschnäpper **Spanish:** Petroica Torrentera  
**Other common names:** Torrent/River Flycatcher/Robin, Grey-and-white Flycatcher

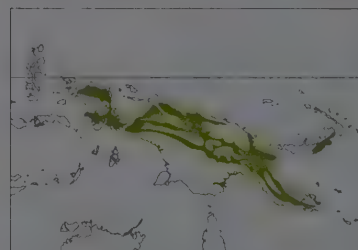
**Taxonomy.** *Muscicapa Mülleriana* Schlegel, 1871, Lobo, Triton Bay, south-west New Guinea.

Genus close to *Microeca*, and possibly better merged with it. New Britain race may conceivably represent a separate species; further study required. Two subspecies currently recognized.

**Subspecies and Distribution.**

*M. m. muelleriana* (Schlegel, 1871) – New Guinea.

*M. m. coulasi* Mayr, 1934 – New Britain, in Bismarck Archipelago.



**Descriptive notes.** 14–15 cm; 23–28 g. Nominant race has crown brownish-black, back pale grey, rump white; large white spot between base of upper mandible and eye; upperwing and tail brownish-black; neck side, throat and underparts white; iris dark brown; bill black; legs blackish-brown. Sexes similar. Juvenile lacks white facial spot, has feathers tipped with contrasting colour. Race *coulasi* is darker than nominate, with back and rump grey, paler light grey underparts, and lacks the white collar.

**VOICE.** Song a short high-pitched piping whistle, singly or as descending accelerating series.

**Habitat.** Fast-moving open rivers and streams

with protruding boulders and sufficient vegetation-free space over them; mainly in hills and lower mountains to 1800 m, occasionally to 2100 m, also in lowlands, particularly near hills. Has been observed up to 100 m from stream.

**Food and Feeding.** Insects. Prey captured by making aerial sallies from exposed perch such as rock, exposed riverbed, fallen log, dead snag, overhanging branch, horizontal branch in nearby clearing or garden area; may occasionally take items from ground.

**Breeding.** Nestlings in early Aug, late Sept and early Nov and individuals in juvenile plumage mid-Oct to mid-Nov, indicating breeding during latter half of dry season (when river levels low), at least. Nest a neat shallow cup of thin rootlets and lichens on foundation of rootlets and mud, with moss on exterior, external diameter 9–9.2 cm, height 6–6.7 cm, internal diameter 6–6.5 cm, depth c. 2–2.5 cm; built around slender limb, once c. 2.5 m above water on ledge of large boulder (30 cm below its top, where grass was growing) in river. Clutch 2 eggs, one described as pale brown with darker brown patches. No other information available.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Locally common, although often scarce. Widely distributed on mainland New Guinea, but apparently very local on New Britain. Has been observed at density of 1 pair every 200 m of stream. Probably present on all suitable streams.

**Bibliography.** Beecher (1978b, 1980), Bell (1969), Coates (1990), Delacour (1946), Dutton (2007a), Gregory (1995b), G. J. Idenstolpe (1955a), Iredale (1956), Mayr (1934a, 1941a), Ogilvie-Grant (1915), Orenstein (1975), Rothschild & Hartert (1903c), Rowley (1970), Safford & Atwood (1996), Salvadori (1881), Symes & Marsden (2005), Tolhurst (1991).





Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family MALURIDAE (FAIRY-WRENS)**



- Small to very small insectivores with long legs and long cocked tail; plumage strongly sexually dimorphic, breeding males with streaked brown or brilliant, largely blue and black, iridescent plumage, females duller.
- 10–22 cm.



- Australia and New Guinea, including some islands.
- Variety of habitats, ranging from tropical rainforest and *Eucalyptus* forest to savanna, grassland and shrubland, including arid and semi-arid areas.
- 5 genera, 27 species, 65 taxa.
- 2 species threatened; none extinct since 1600.

### Systematics

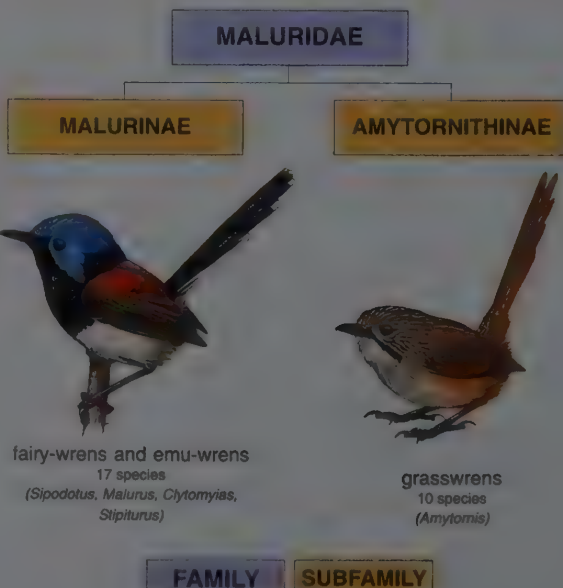
In early classifications, many Australian taxa were placed close to groups of Eurasian or African taxa having similar, convergent morphology or ecological roles, and they were labelled as “flycatchers”, “thrushes” or “warblers”. The fairy-wrens and their allies were given the name of “warblers” or “wren-warblers”. From the time when they were first described, their affinities remained uncertain for some 200 years until 1985, when the molecular-genetic work of C. G. Sibley and J. E. Ahlquist revealed the existence of an independent radiation of passerine families in the continental mass that gave rise to Australia. Subsequent work by P. G. P. Ericson, F. K. Barker and others has refined the view of passerine radiation, and suggested that the ancestors of the oscine passerines became isolated in the Australian landmass after the break-up of the southern supercontinent of Gondwana. The oscines underwent a significant radiation in the Australo-Papuan region, and it is thought that it is from here that the ancestors of the vast radiation of the “parvorder” Passerida spread.

No fossil of any malurid is known before the Quaternary, but Australian fossil material identifiable as passerine in origin dates back to the Eocene, 55 million years ago. Fossil material from the Miocene, 15–25 million years old, represents several modern passerine families and supports the DNA evidence of a radiation of old endemic Australian families. The DNA studies indicate that Maluridae is an ancient lineage which has been isolated for 20 million years or longer from its nearest relatives, the honeyeaters (Meliphagidae), the pardalotes (Pardalotidae) and the thornbills (Acanthizidae).

The first malurid described, the Superb Fairy-wren (*Malurus cyaneus*), was originally named as *Motacilla cyanea*, meaning “blue wagtail”, because of its long cocked tail. J. Gould, in his *Handbook to the Birds of Australia*, published in 1865, did not assign *Malurus* to any known family, although later taxonomists of the nineteenth and twentieth centuries included it variously with the Old World warblers (Sylviidae) and the Old World flycatchers (Muscicapidae). E. Mayr and D. Amadon recognized a subfamily Malurinae within the Muscicapidae, which included other small insectivorous species from Australia such as the *Acanthiza* thornbills and the pardalotes. In 1969, C. J. O. Harrison recognized the mutual affinities of *Malurus*, *Stipiturus*, *Amytornis* and the New Guinea genera *Sipodotus* and *Clytomyias*, on the basis of a shared interscapular gap (apterium) in the dorsal feather tracts. He regarded them as a subfamily of Timaliidae (babbler),

which at that time was also considered to include the Australasian babbler (Pomatostomidae), because these genera shared with the timaliids the habit of co-operative breeding. After the early work by Sibley on egg-white proteins had raised doubts about the relationships of Australian passerine species with the families in which they were at that time placed, the 1975 “Interim List” of the Royal Australian Ornithologists Union (RAOU) recognized the fairy-wrens, grasswrens and emu-wrens as constituting a family in its own right, the Maluridae. This treatment was maintained in the taxonomic list adopted by the RAOU in 1994, which is based on the taxonomy of Sibley and B. L. Monroe, with some modifications, and was further refined in the recent systematic treatment by R. Schodde and I. J. Mason in their “Directory” of Australian passerines.

In his 1982 monograph of the Maluridae, Schodde listed as distinguishing characters of the family the interscapular gap, the possession of a tail with no more than ten rectrices, the outer pair much reduced or absent, and, at the base of the skull, enlarged tympanic chambers, or “bullae”, formed from exoccipital and



Subdivision of the  
Maluridae

(Figure: Hilary Burn)

Fairy-wrens are striking birds. Some are particularly spectacular, such as the aptly named **Superb Fairy-wren**.

The males of this family, and notably this genus, display two very different plumage styles. Here we see a male in so-called "Bright" plumage, with bold patches of glistening colour. The garb of "Bright" male fairy-wrens is predominantly blue, violet or black, with some red or white tinges, all superimposed on a general body colour of blue or black, or blue with buff or white. Other males are mainly brown-coloured, the so-called "Dull" plumage. Males in either plumage are capable of breeding.

[*Malurus cyaneus cyanocephalus*, Sydney, Australia.

Photo: Cyril Laubscher]



parasphenoid bones. The function of these bullae is not clear, but is probably related to sound reception. Further distinguishing osteological features of the palate and the head of the humerus are noted by Schodde and Mason. The maxillo-palatine processes of the palate are long and strap-like in form, and the vomer over which they extend is bifidly horned and resembles that of the meliphagids. On the other hand, the head of the humerus has only two fossae, and these are furrow-like, shallow and unpneumatized, resembling the condition found in the acanthizids.

The Maluridae are divided into two main groups, easily distinguishable by plumage, and regarded as subfamilies by Sibley and Monroe. One of these, the Malurinae, consists of four genera, two of which, *Sipodotus* and *Clytomyias*, are monotypic and are restricted to New Guinea, the other two being *Malurus*, containing the twelve species of fairy-wren, and *Stipiturus*, with the three tiny emu-wrens. The fairy-wrens have brilliantly coloured males, generally iridescent blue, whereas the emu-wrens have streaked brown plumage and very long filamentous tail feathers. The second subfamily, the Amytornithinae, contains only one genus, *Amytornis*, with ten species of grasswren. These are larger than fairy-wrens, and cryptically streaked with black and white on reddish-brown. While fairy-wrens are found in Australia and New Guinea, emu-wrens and grasswrens are present only in Australia.

Although past controversy concerning the definitions of species and subspecies was considerable, recent morphological and molecular studies have helped to clarify species relationships in Australia. Nevertheless, further molecular studies are required in order to assess whether more or fewer subspecies are warranted. In New Guinea, variation within species is not well known, museum specimens are few and scattered, and little recent work has been done on the family. Of the two endemic New Guinea genera, the molecular affinities of Wallace's Wren (*Sipodotus wallacii*) within the Malurinae have never been determined; the Orange-crowned Wren (*Clytomyias insignis*) is more closely related to *Malurus* than to *Stipiturus*, although it has no blue colours in its plumage. Neither genus has been intensively studied.

The biochemical studies carried out by L. Christidis and Schodde indicate that the twelve species currently making up the genus *Malurus* include five lineages. Two of these five are single-species groups, one containing the Broad-billed Fairy-wren

(*Malurus grayi*) and the other the Emperor Fairy-wren (*Malurus cyanocephalus*); both are blue and both are confined to New Guinea. The third, the "chestnut-shouldered *lamberti* group", consists of the Lovely (*Malurus amabilis*), Variegated (*Malurus lamberti*), Blue-breasted (*Malurus pulcherrimus*) and Red-winged Fairy-wrens (*Malurus elegans*) of Australia, while the fourth, the "Australian blue group", contains the Superb, Splendid (*Malurus splendens*) and Purple-crowned Fairy-wrens (*Malurus coronatus*). The fifth and final of the five lineages identified by Christidis and Schodde is the "bicoloured group" of Australia and New Guinea, comprising the Red-backed (*Malurus melanocephalus*), White-winged (*Malurus leucopterus*) and White-shouldered Fairy-wrens (*Malurus alboscapulus*). Species within each of the three lineages that occur in Australia do not generally overlap in distribution, but in any one place one species from each of the three lineages may be found.

The two blue New Guinea species, the Broad-billed and Emperor Fairy-wrens, were originally assumed to be close to the blue Australian forms the Superb, Splendid and Purple-crowned Fairy-wrens, but biochemical evidence indicates that they are separate lineages, long distinct. The Broad-billed Fairy-wren is the least known of all the New Guinea malurids. It comprises two non-overlapping subspecies which were initially regarded as two separate species.

Taxonomically, the most difficult of the *Malurus* species is the bicoloured White-shouldered Fairy-wren of New Guinea, for which as many as eleven or twelve subspecies have been named, although only six are currently recognized. Variations in size and female plumage with habitat and altitude make this widespread species particularly obscure, and no relevant biochemical data are yet available. Schodde suggested that populations of this lowland species along different river systems have diverged in isolation from each other. The Australian species in this "bicoloured group" have more or less non-overlapping distributions, the Red-backed Fairy-wren occurring in the north and east, with two subspecies, and the White-winged Fairy-wren in central and western drier habitats, with two island subspecies and one mainland one. Although White-winged Fairy-wrens exhibit no distinct morphological differences among populations over the whole of inland arid and semi-arid Australia, recent work by A. C. Driskell and others suggests that there are



significant genetic differences between eastern and western populations. Ancestral bicoloured fairy-wrens were clearly widespread across the north of the Australian landmass, including the lowlands of New Guinea, where they became isolated during a period when high sea levels separated northern Australia from New Guinea. Schodde has suggested that the other New Guinea species represent early-diverging branches of the malurid line which became isolated in New Guinea rainforests.

Within the Australian "chestnut-shouldered complex", the position of the northern forms, the females of which have varying amounts of blue in the plumage, has been uncertain in the past. The north-eastern form *amabilis*, from Cape York Peninsula, in north Queensland, has been treated by various authors as ■ separate species or as ■ subspecies of the Variegated Fairy-wren, or been allied with other blue forms of the latter as the subspecies *dulcis*. Biochemical information, combined with other differences in plumage, has established *amabilis* as ■ sister to the *M. lamberti* group, the two forming a superspecies. The Variegated Fairy-wren includes two northern subspecies, *dulcis* and *rogersi*, which are similar to *M. amabilis*, the Lovely Fairy-wren, in having blue-plumaged females. The contiguous distribution of the Red-winged, Blue-breasted and Variegated Fairy-wrens in south-western Australia is interpreted by Schodde as the result of successive cycles of aridity, each species representing an episode of expansion to the south-west of an ancestral northern *Malurus* form in ■ wetter period, followed by isolation of the population in the south-west with increasing aridity. The Red-winged Fairy-wren, in the extreme south-west, exhibits the greater differences from the Variegated Fairy-wren. Within the latter species, one subspecies, *assimilis*, is widespread over the arid and semi-arid area of inland Australia; each of the other four has a more restricted distribution at the coastal fringes.

The Purple-crowned Fairy-wren is so distinct in plumage that its affinities with the "Australian blue group" were unrecognized until demonstrated by the biochemical studies of Christidis and Schodde. This species does, however, share the relatively larger size and strong complex calls of the Superb and Splendid Fairy-wrens and, biogeographically, its northern distribution complements theirs in the south. The Superb Fairy-wren occupies the south-east corner of Australia, with different subspecies in Tasmania and on the islands in Bass Strait, between Tasmania and

mainland Australia. It forms a superspecies with the Splendid Fairy-wren, which is widely distributed across the drier inland areas south of 20° S, with four subspecies differing markedly in the tone of their deep blue overall colour and in the extent of black bands, especially on the back and the pectoral region. These races intergrade where they abut geographically.

Of the three species in the genus *Stipiturus*, the Mallee Emu-wren (*Stipiturus mallee*) has at different times been included in either the Southern Emu-wren (*Stipiturus malachurus*) or the Rufous-crowned Emu-wren (*Stipiturus ruficeps*). Biochemical data have suggested that it is, in fact, a distinct species, aligned with *ruficeps*, and having a very restricted distribution in inland south-east Australia, lying between those of its two congeners. The coastal species, the Southern Emu-wren, shows considerable variation over a wide geographical range, among populations on islands or isolated in islands of its preferred swampy heathland habitat; as many as twelve subspecies have been described, eight of which are currently recognized. The other inland species, the Rufous-crowned Emu-wren, is restricted to the spinifex, or hummock grasslands, of arid central and western regions of Australia; some differentiation occurs across its wide range, but this has been insufficiently studied.

The grasswrens in the genus *Amytornis* have proved particularly difficult to study. This is a result of both their secretive nature and the fact that many of them occur as small, isolated populations in remote, inaccessible habitats in northern and inland Australia. The majority of the species live where the understorey vegetation is hummock grassland known as spinifex, consisting of grasses of the genera *Triodia* and *Plectrachne* (see Habitat). Much confusion stemmed from misidentification of some early specimens from central Australia. Recent researchers have recognized ten species, with a total of 15 subspecies. Schodde and Mason recognized some superspecies groups, namely the Short-tailed (*Amytornis merrotsyi*) and Striated Grasswrens (*Amytornis striatus*), the White-throated (*Amytornis woodwardi*) and Carpentarian Grasswrens (*Amytornis dorotheae*), and probably the Dusky (*Amytornis purnelli*) and Kalkadoon Grasswrens (*Amytornis ballarae*). Relationships among the other species are not yet clear, although the distinctive Grey Grasswren (*Amytornis barbatus*) certainly appears to be separate from the rest.



Cryptically plumaged, secretive and mainly living in remote spots in northern Australia, grasswrens can be hard to find. When located, this **Short-tailed Grasswren** reveals ■ typical malurid shape, well adapted for terrestrial life: long, stocky legs; robust feet; slim body; and short wings. Despite the species' name, the tail is actually quite long, and it is held cocked; the outer tail feathers are only half the length of the rest. Most grasswrens' bills are also a useful adaptation; being shorter, narrower and deeper than in other malurids, they enable the grasswrens to consume the seeds that form a large part of their diet.

[*Amytornis merrotsyi*, Flinders Range, South Australia, Australia. Photo: Peter Fuller]

### Morphological Aspects

The small size, the cocked tail, the preference for dense cover and the grey-brown plumage probably led to the use of the term "wren" in the vernacular names of members of this family. The smallest species are the emu-wrens in the genus *Stipiturus* and Wallace's Wren in *Sipodotus*, with a body mass of less than 10 g and, in the case of the Mallee and Rufous-crowned Emu-wrens, only about 6–7 g. The *Malurus* fairy-wrens and the Orange-crowned Wren weigh 7–15 g, with most in the region of 9–10 g, while the *Amytornis* grasswrens are larger, ranging roughly from 15 g to 35 g, these extremes represented respectively by the Eyrean Grasswren (*Amytornis goyderi*) and White-throated Grasswren.

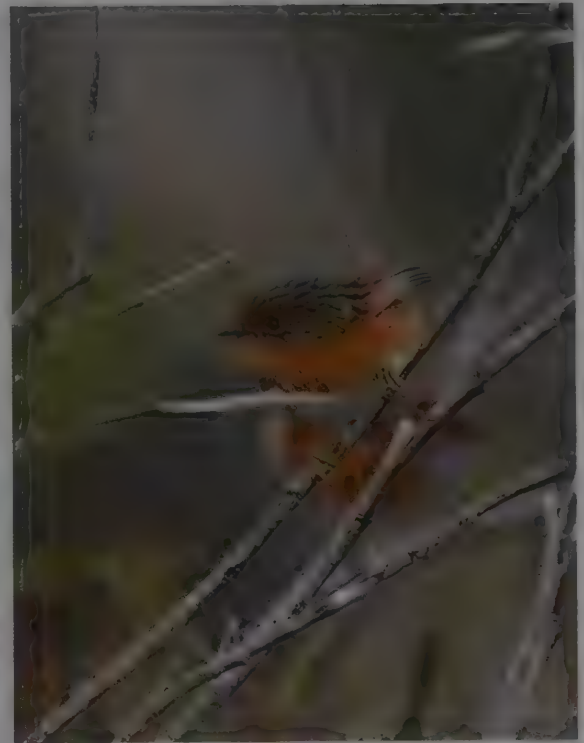
Most members of the Maluridae forage mainly on the ground or in low vegetation close to it (see Food and Feeding), and they possess long tarsi and short wings, the morphological features generally associated with this mode of foraging. The wings have ten primaries and are short and rounded, with primaries P1 to P7 similar in length. The length of the tarsus of most species is about 20–25 mm, which is long for passerines of 10–20 g; only the largest, the White-throated Grasswren, and the two smallest, the Mallee and Rufous-crowned Emu-wrens, lie outside this range, having tarsus lengths of, respectively, 28 mm and 15 mm. Purple-crowned Fairy-wrens, which often forage among the spiny fronds of the prickly palm *Pandanus aquaticus*, have relatively robust feet and tarsi, as also have the *Amytornis* grasswrens, the most terrestrial members of the family.

The most characteristic morphological feature common to all malurid species is the long tail. With the exception of the three emu-wrens, it has ten rectrices, with the outer pair generally reduced. The innermost rectrices are the longest, and, on most fairy-wrens and grasswrens, all of the rest, except the outer pair, are similar in length. On the fairy-wrens, the outermost pair is about one-fifth the length of the other eight, and the outermost rectrix of the grasswrens is about half the length of the rest. Wallace's Wren exhibits more gradation in length of the inner eight tail feathers, with the outer pair short, as in *Malurus*. In the tail of the Orange-crowned Wren only four graduated pairs of rectrices are readily apparent, the outer pair being greatly reduced. The emu-wrens have what is relatively the longest tail of all the malurids, but with only three pairs of highly modified rectrices. The shafts of the rectrices are strong, but the barbs are sparse and lack the hooks that mesh the barbules together, giving the feathers the filamentous appearance typical of Emus (*Dromaius novaehollandiae*). The Southern Emu-wren has the longest tail with the sparsest barbs. The tail is generally carried cocked nearly at right angles to the body when the bird is perched or hopping, but in flight it trails straight out behind the body, drooping slightly.

Within the fairy-wren genus *Malurus*, the four members of the "chestnut-shouldered group" (see Systematics) have a relatively long tail for their general size, while the three in the "bicoloured group", the Red-backed, White-winged and White-shouldered Fairy-wrens, possess a tail that is, by comparison, relatively short. Male fairy-wrens in breeding plumage have a shorter tail than those of females and immature males. Among the *Amytornis* grasswrens, tail length is generally closely related to body size, except in the case of the Grey Grasswren, which has a particularly long tail. Many *Malurus* species have a white-tipped tail, but the extent of the white at the tips varies with age, sex and feather wear. These white tips appear to emphasize the tail when the bird is foraging and in general signalling, and they are particularly obvious on the Lovely Fairy-wren.

The other morphological features unique to Maluridae are not immediately obvious. All members of the family have a gap in the mid-dorsal spinal tract of feathers, this being known as the interscapular gap or apterium. This gap is concealed by feathers from the nape and, from each side, by the scapulars, which are long, profuse and often erectile. Unique features of the skull, involving the palate and the auditory region, and the humerus were discussed in detail by Schodde and Mason (see Systematics).

Bill shape varies considerably among the species, reflecting differences in diet and in foraging methods. I. Rowley and E. Russell distinguished three main shapes. A relatively long, narrow, pointed bill, only slightly wider at the base, and with a width



greater than the depth, is typical of emu-wrens, Australian fairy-wrens and the White-shouldered Fairy-wren of New Guinea. These species are almost entirely insectivorous, and forage mostly on the ground or in low vegetation by gleaning over a surface, probing, and making an occasional aerial sally from a perch. Their rictal bristles are poorly developed. The second type of bill is long, broad at the base, much wider than it is deep along its length, and with the rictal bristles well developed. Such a bill is possessed by the four other New Guinea species, namely the Broad-billed and Emperor Fairy-wrens, Wallace's Wren and the Orange-crowned Wren; the smallest of the four, Wallace's Wren, has the largest bill in relation to its body size. All four are insectivorous arboreal foragers, gleaning and striking upwards at prey when in flight. The third bill type, relatively shorter, narrower and deeper, is typical of most grasswrens; the depth of the bill is equal to or greater than its width, and the rictal bristles are well developed. The grasswrens' diet frequently includes some seeds, and the most extreme bill development is exhibited by the Eyrean Grasswren and the Thick-billed Grasswren (*Amytornis textilis*), which possess a bill reminiscent of that of a finch (Fringillidae).

Two very different plumage styles are displayed by the family. In the subfamily Malurinae, many male fairy-wrens in the breeding season are brilliantly patterned in iridescent blues and black, these being known as "Bright" males, whereas some other males ("Dull" males), along with females and immatures, are generally brown. Many descriptions of plumages refer to "breeding males", "immatures" and "non-breeding males". With malurids, two brown individuals, one male and the other female, may attend a nest and raise young; they appear to be a breeding pair, and the brown-plumaged male is therefore called a "breeding male". Since extra-pair copulations are of widespread occurrence among fairy-wrens (see Breeding), however, true paternity is frequently unknown, and it is better therefore to refer to such brown-plumaged males as "Dull" males, in contrast to full-plumaged "Bright" males. The iridescence of the male plumage often makes it difficult to be sure of colours, in particular whether the breast is black, as that of the Variegated Fairy-wren, or navy-blue, as that of the Blue-breasted Fairy-wren, in areas where these two species occur close together, or whether the colour of the crown and ear-tufts is cobalt-blue or violet or somewhere in between. Among the Australian fairy-wrens, most males assume this Bright plumage only in the breeding season, but males of the three New Guinea species exhibit the same plumage coloration

The three emu-wrens take the long-tail characteristic of malurids to an extreme.

They have only three pairs of rectrices, all highly modified.

The shafts are strong but the barbs sparse, producing the filamentous appearance typical of the Emu (*Dromaius novaehollandiae*), which gives the genus its common name.

The Southern Emu-wren has the longest tail with the sparsest barbs.

The tail is usually cocked at right angles to the body. The bird in the foreground is a female; she lacks the sky-blue throat and breast visible in the male behind.

[*Stipiturus malachurus*, Anglesea, Victoria, Australia.

Photo: Peter Fuller]





The only member of its genus, the **Orange-crowned Wren** is one of five malurids endemic to New Guinea. It resembles a rufous version of a female fairy-wren (*Malurus*), but with orange crown and ear-coverts. Sexes are identical in plumage and measurements. Genetic analysis does not shed much light on this species' intra-family affinities, but has revealed that *Clytomyias* is more closely related to *Malurus* than it is to the emu-wrens (*Stipiturus*). The species' bill morphology is adapted to its life as a gleaner of insects, being long and broad-based, with well-developed rictal bristles.

[*Clytomyias insignis aoti*, Huon Peninsula, NE New Guinea. Photo: William S. Peckover]

and pattern throughout the year. Plumages of male fairy-wrens are predominantly of blue, violet and black, with some tinges of red and white, superimposed on a general body colour of blue, black, or blue with buff or white. The crown, ear-tufts, scapulars and upper back are all significant areas which may be contrastingly coloured against a plainer background, and all are important in displays (see Breeding).

Possession of a blue crown, black face and nape, and erectile ear-tufts is common to the males of most species of all lineages of *Malurus* except the "bicoloured group" (see Systematics). In the blue and chestnut-shouldered lineages, the crown, upper back and elongated ear-tufts are iridescent blue of various shades, from silvery blue to violet; the crown and ear-tufts, in particular, are significant in threat and breeding displays. In the "chestnut-shouldered group", rich chestnut scapulars fall over the shoulders of the wing. Although the Purple-crowned Fairy-wren is genetically associated with the Australian blue lineage, it is only the male's crown that is brilliantly coloured, being deep purple surrounded by a black band through the eye and nape; the rest of the plumage is similar to that of the female. In the bicoloured species, the dark blue or black of the head and body contrasts with the scapulars and upper back, which are red on the Red-backed Fairy-wren and white on the White-winged and White-shouldered Fairy-wrens. These contrasting red or white feathers are erectile and feature in displays (see Breeding). Microstructural analysis of the feathers from the blue, mainland subspecies and the black, island race of the White-winged Fairy-wren suggests that increasing melanin density may mask the blue-producing microstructure of the feathers in the black island race. This difference appears to have a simple genetic basis. In the two endemic New Guinea *Malurus* lineages, the striking all-blue Emperor Fairy-wren lacks contrasting ear-tufts, whereas the Broad-billed Fairy-wren has the crown blue and black, with the black concentrated in the centre, the ear-tufts blue and elongate, and the overall body colour a paler blue.

Females of the Australian *Malurus* species are generally greyish-brown above and buff ventrally. They differ among species in the colour of the back, lores, ear-tufts and bill, ranging from the Lovely Fairy-wren, with a smoky blue back, turquoise ear-tufts, white lores and a black bill, to the very plain females of the Australian bicoloured fairy-wrens, which are light reddish-brown above and buff below, with an orange bill and only faint mark-

ings around the face and eye. Females of the New Guinea *Malurus* are more colourful, the female Emperor Fairy-wren having the same head coloration as the male's, with a red-brown back and a white belly; the immature of this species resembles the female. The female Broad-billed Fairy-wren is similar in pattern to the male, but without blue in the crown and with a white belly. The remarkable variation in the colour of females of the New Guinea bicoloured form the White-shouldered Fairy-wren, discussed in detail by Schodde, is not well understood, although it has been the basis of the description of more than a dozen subspecies at different times. Females of this species may be plain brown as those of Australian bicoloured fairy-wrens, or they can be black and white as the male of the species, although less iridescent and with brown wings, or they can be pied, with a black back and white scapular tufts, brown wings, and whitish breast and flanks blotched with black. Brown females occur in southern New Guinea, in drier regions of eucalypt (*Eucalyptus*) savanna woodlands similar to those of northern Australia.

In the genus *Stipiturus*, comprising the three emu-wrens, the blue colour is confined to the throat, upper breast and ear-coverts of males, and this becomes visible on five-day-old nestlings. The upper surface is streaked red-brown, similar to that of the *Amytornis* grasswrens, and the ear-coverts are streaked black, while the ventral surface is unstreaked and varies from reddish-buff to white. Males retain their blue colour throughout the year, and there is no change to a dull plumage in the non-breeding season.

Also within the Malurinae, the Orange-crowned Wren of New Guinea resembles a rufous version of a female fairy-wren, but with an orange crown. The sexes are indistinguishable in size or plumage. Likewise in the other monotypic New Guinea genus, *Sipodotus*, the male and the female of Wallace's Wren are very similar to each other, except for the yellow throat and breast of the female. At first sight they are unlike any other member of the family, but the pattern of a blue-looking crown, albeit black flecked with blue, a black face, a reddish back and a white belly is similar to that shown by the female Emperor Fairy-wren, and Wallace's Wrens have the typical malurine ear-tufts, white and elongated.

The ten grasswrens comprising the subfamily Amytornithinae are more cryptically patterned in reds, browns and buff, disrupt-

tively streaked with black and white. The individual feathers can have very complex markings, such as red-brown webs with a paler buff fringe and a white streak edged with black along the central shaft. The dorsal surface is generally more streaked than is the ventral one, and subtle patterns are achieved when one colour, black, white or brown, is emphasized in the streaking of a particular region, such as the ear-coverts, head or breast. Black facial markings are found in some species, the Eyrean, White-throated and Carpentarian Grasswrens sporting a dark malar stripe and the Grey Grasswren exhibiting a complex pattern which includes a black eyestripe. The sexes are generally very similar to each other, except that females have more rufous flanks and sometimes a more rufous belly. Males retain the same appearance through the year, and there is no change to a Dull plumage in the non-breeding season.

During the breeding season, male fairy-wrens develop a sperm-storage structure and testes that, in relation to body size, are among the largest found within the passerines. The sperm-storage structure is a swelling around the vent, and is called the cloacal protuberance. In the breeding season, that of the Superb Fairy-wren has average dimensions of 7.9 mm long by 6.3 mm wide by 5.3 mm high, with a prominent pointed tip at the anterior end. The protuberance changes seasonally, and in winter it is generally not obvious. That of Superb Fairy-wrens in Canberra, in south-east Australia, begins to enlarge, on average, about 3–4 weeks before the first eggs are laid, well after males begin their pre-breeding body moult into Bright plumage; it declines after the breeding season, when the birds start their post-breeding moult. The large cloacal protuberances and testes of fairy-wrens provide large stored reserves of sperm, presumably for extra-pair copulations, which occur with a very high frequency among fairy-wrens (see Breeding). The daily rates of sperm production, sperm reserves and sperm densities are, per gram of body mass, among the largest reported for any of the world's birds or mammals. Cloacal protuberances are present also in grasswrens, but J. Karubian found that the cloacal protuberance of the Striated Grasswren was relatively much smaller than those of fairy-wrens, and that the number of sperm produced was much lower.

Australian malurids have a complete moult, which starts after the breeding season, often in January, and is complete by April

or May in southern Australia. For the lesser-known northern species, the timing appears to be similar. In southern Australia, the mass of contour plumage, and therefore plumage insulation, of Superb Fairy-wrens is greater in winter than in summer. Although the tail feathers are moulted at this time, they may be lost and replaced at any time of the year; the primary moult is descendant. A pre-breeding partial moult of most body feathers occurs in late winter or early spring. In the case of males, the Dull plumage of the non-breeding season is replaced completely or partly by the Bright plumage of the breeding season. The onset of this moult, which lasts for about a month, varies according to age, social status and condition, younger males beginning in August or September and older, more dominant ones starting as early as April in southern Australia. Some adults acquire little or no non-breeding Dull body plumage, appearing instead to moult directly from one Bright body plumage to another. In studies of Superb Fairy-wrens carried out in Canberra, R. A. Mulder and M. J. L. Magrath found that only five of 426 males, fewer than 1%, did this; all five were more than four years old, but not all males older than four years moulted in this way each year. This direct moult from an old Bright plumage to a new Bright one has been recorded also for the Splendid and Red-winged Fairy-wrens.

Females, too, appear to undergo a pre-breeding body moult with no obvious change in appearance. Juveniles may have a complete moult 2–3 months after fledging, but late-hatched individuals often moult only some flight-feathers. Young males in their first year may undergo a partial or complete moult of the body feathers in spring. In the case of the Superb and Splendid Fairy-wrens, first-year males acquire almost complete adult male Bright plumage. In contrast, first-year males of the Red-winged and Blue-breasted Fairy-wrens rarely attain full Bright plumage but, instead, take on a spotty appearance. Those male White-winged Fairy-wrens which do not achieve Bright plumage until they are 2–3 years old may undergo an incomplete body moult.

Emu-wrens, having no alternate Bright plumage in the breeding season, undergo a complete moult after breeding. Although the primary moult is completed in late summer to early autumn, the moult of the body feathers can be spread over a longer time period. The extent and timing of the juvenile moult are not known. Grasswrens probably perform a single complete moult after breed-

The genera *Malurus* and *Stipiturus* are strongly sexually dimorphic, while the monospecific *Sipodotus* is slightly so. The difference between the sexes is most striking in fairy-wrens, such as this **Purple-crowned Fairy-wren**. The lower bird is a male in "Bright" plumage. His violet crown-sides are offset by a black mask and central crown stripe. The accompanying female has a grey crown and deep chestnut ear-coverts. Both have blue tails, but the male's is brighter than his partner's. "Dull"-plumaged males resemble the female, but with a less contrasting face.

[*Malurus coronatus coronatus*, Victoria River Crossing, about 190km SW of Katherine, Northern Territory, Australia. Photo: Chris Ross]







Throughout Australia and New Guinea, Maluridae live in a variety of habitats from arid shrublands to tropical forests, but all prefer areas with a dense understorey up to 2 m in height. Several fairy-wrens (Malurus) have quite narrow habitat requirements, being dependent, for example, on dense riparian vegetation or tall grassland. The **White-winged Fairy-wren** is tied to arid or semi-arid areas, where it resides in low shrubs, particularly samphire on salt pans. In taller vegetation, it is replaced by the **Variegated Fairy-wren** (*M. lamberti*) and the **Splendid Fairy-wren** (*M. splendens*).

[*Malurus leucopterus leuconotus*, François Peron National Park, Western Australia, Australia.  
Photo: Günter Ziesler]

ing. The juveniles of these species undergo a partial moult of the body feathers soon after fledging, before the tail is fully grown.

In New Guinea, moult is less seasonal, and can be protracted over a longer period of time. With no alternation between Bright and Dull plumages, there is only a single, complete annual moult.

## Habitat

In global terms, Australia is an arid country and its interior is only sparsely vegetated, but, compared with other areas with similar low rainfall, its deserts are well vegetated, with a variable cover of grasses and shrubs. Except for the higher-rainfall areas near the coast, most of Australia is arid or semi-arid. 75% of the landmass having an average rainfall of less than 250 mm, with extended periods during which little or no rain falls. Even the species of tropical northern Australia live in areas with a protracted dry season. Eucalypt forests and woodlands are restricted to higher-rainfall areas of the periphery. Acacias (*Acacia*) form the dominant component of much of the arid and semi-arid shrubland. The endemic hummock grasses of the genera *Triodia* and *Plectrachne* form a prominent understorey in open woodlands and shrublands over about a quarter of the land surface of Australia, and they are the principal habitat of several species of malurid. The hummocks are made up of a mass of repeatedly branching stems with long, spine-like leaves which form a mound up to 1–2 m high and 2 m wide. Hummock grasses are commonly called “spinifex”, because of their resemblance to the coastal grass *Spinifex*. In the rocky ranges of arid areas, spinifex may be almost the only vegetative cover.

Throughout Australia and New Guinea, the Maluridae are found in habitats ranging from arid shrublands to tropical forests, but most often in habitats with dense vegetation growing to about 2 m in height. The two genera restricted to New Guinea, *Spodoptes* and *Clytomyias*, containing Wallace’s Wren and the Orange-crowned Wren, are more often to be found in the subcanopy at up to 40 m in rainforest, while *Malurus*, *Amnytorus* and *Stipiturus* species rarely venture more than 2 m above the ground. The habitats occupied by these three genera include shrubby coastal heathland, shrubby or grassy understorey of forest or of savanna woodland, arid shrubland and hummock grassland. In addition, the Purple-crowned Fairy-wren occurs in dense

tropical riverine vegetation, the Red-backed and White-shouldered Fairy-wrens in tall tropical grassland, and the Broad-billed Fairy-wren even in the understorey of tall primary rainforest. Two other species of the wet tropics prefer forest edge and other dense habitats, the Emperor Fairy-wren in New Guinea and the Lovely Fairy-wren in north-east Australia.

The habitat requirements of some fairy-wrens are rather loose. One such example is provided by the Superb Fairy-wren, a species which is widespread and survives even in some degraded agricultural and suburban developments. Other malurids, especially the grasswrens and emu-wrens, are very specific in their requirements, and habitat modifications have led to notable range decreases for some of these species. The grasswrens typically live in arid and semi-arid habitats, often in hilly regions with extensive rocky slopes covered in spinifex. These rocky habitats are a good year-round source of insects, and they also provide plentiful shelter sites that are good thermal buffers on hot summer days and cold winter nights. Emu-wrens prefer habitats with dense vegetation up to 1 m tall, especially in the coastal heathlands. These latter habitats are under increasing pressure from urban development.

## General Habits

Apart from the brilliant plumage of male fairy-wrens, one of the striking features of the family is that its members are often seen in groups larger than a pair. These spend most of their time, throughout the year, together, moving, feeding and roosting as a group. In the breeding season, the additional individuals assist in the feeding of nestlings and in tending to the needs of fledglings (see Breeding). For this reason, the co-operatively breeding fairy-wrens are the most intensively studied of all Australian passerines.

Some of the early records referred to Superb Fairy-wrens as “mormon wrens”, since many groups appeared to consist of a single conspicuous full-plumaged male and several brown individuals, assumed to be his “harem”. More careful study revealed that many of these brown birds were, in fact, males in Dull plumage (see Morphological Aspects); fully group-members, they had not yet achieved full breeding plumage. The clarification of the plumages of immatures and those of the two sexes enabled the identity of group-members to be understood, and showed that a

Whilst several malurids have specific habitat requirements, some fairy-wrens are relatively catholic when it comes to habitat usage.

The **Superb Fairy-wren** falls into the latter category. The species originally inhabited open eucalypt (*Eucalyptus*) forest, but this has been cleared for agriculture.

Subsequently, it has adapted well to human alteration of the landscape, surviving in degraded agricultural land and even in suburban developments. The bird in this photograph is one such urban dweller, having found a non-native cactus to its liking.

[*Malurus cyaneus cyanochlamys*,  
Brisbane, Australia.  
Photo: Rolf Kunz]



group was composed basically of a pair and its progeny from previous years. For all species of fairy-wren so far studied, populations have more males than females. This bias arises because dispersal is undertaken mostly by females, which in consequence suffer higher mortality. In the "blue" and "chestnut-shouldered" fairy-wrens (see Systematics), groups may include several Bright males. Throughout the year, group-members forage together all over their territory, and react together in defence against trespasses by conspecifics or in alarm when predators approach.

In a study of the Splendid Fairy-wren, it was found that groups consisted of two to eight adults, usually three or four, with both male and female helpers. Although most young birds helped for only one year before disappearing, or before becoming established as breeders in their own groups or elsewhere, a few stayed for longer, one for ten years; a few female helpers even attempted to nest, in addition to the primary breeding female. The length of time over which an individual remained as a helper depended on whether an opportunity arose for it to inherit its natal territory, to move to a vacancy elsewhere, or to establish a new territory if a partner was available. Another of the "blue" fairy-wrens, the Superb Fairy-wren, has been studied at several sites in eastern Australia. With this species, population turnover is relatively high and most females can find a breeding opportunity at one year of age, as a consequence of which the groups, of three to five adults, only rarely included female helpers. Moreover, in one study in western New South Wales, no helpers at all were detected during three dry years when very few pairs bred successfully.

Russell and Rowley studied the Red-winged Fairy-wren, which lives in the understorey of tall eucalypt forest in well-watered habitat in south-western Australia. They found that the mortality of breeding individuals is low and that vacancies for new breeders are uncommon, with the result that the groups are larger and fewer pairs have no helpers. In one year, a group included four full-plumaged males of different ages, as well as females and immatures. Many young birds stayed as helpers for longer than one year, female helpers were common, and the age at first breeding was 2–3 years, rather than 1–2 years as with most other fairy-wrens studied. Similar group organizations have been revealed through detailed studies of marked individuals in populations of Purple-crowned, Variegated, Blue-breasted and Red-backed Fairy-wrens and Southern Emu-wrens.

Among the White-winged Fairy-wrens of the "bicoloured group" (see Systematics), blue males are rarer, and males seldom become fully blue until they are three years old. Other males in the group that are subordinate to the dominant blue male do not become blue unless the blue male disappears or they become dominant in another group. White-winged Fairy-wrens have a more complex group structure, which is still not fully understood. They appear to live in groups containing several breeding females, each with a male partner in brown Dull plumage, and a single Bright male in full blue plumage. The territory area defended by the dominant Bright male and the rest of the group includes the nesting areas of all of the breeding females in the group. The blue male has his own female partner, and she and other females may also have non-breeding helpers, generally brown males. In studies of the black race of the White-winged Fairy-wren on Dirk Hartog Island, off Western Australia, it was found that helpers were few, and that pairs were largely socially monogamous, perhaps owing to their observed lower reproductive success.

For most of the remaining species in the family, evidence of co-operative breeding is weaker, but, for grasswrens, emu-wrens and the five malurids in New Guinea, the occurrence of groups at all times of the year suggests that the young of these species probably delay dispersal (see Breeding).

Since most malurid territories are occupied continuously throughout the year, they tend to persist spatially, and populations tend to fluctuate within that framework according to the productivity achieved in successive seasons, and the level of survival. Most fairy-wrens have small clutches, but they may produce more than one brood in the course of a long breeding season (see Breeding). After a good year, the number of immatures reaching the next breeding season will be reflected in the size of the group. Usually, young females stay in the group only briefly, unless they replace their mother. Males, on the other hand, can remain for many years, until they inherit the lead role or, in some cases, move to an adjacent territory to occupy a vacancy there. After a poor breeding season with low productivity and survival, the incidence of pairs may be high. After a good season, there may be few pairs and groups of 5–8 individuals may occur. Most malurids that have been studied are sedentary, resident within the same territories through the entire year and from one year to the next. When all the suitable habitat is occupied, and because male group



leadership generally passes to another group-member, territories persist in much the same place for many years.

In continuous habitat, territories form a mosaic, with each territory bounded by those of several neighbours. Fairy-wren territories are commonly 1–2 ha in size, but the areas occupied by the larger, more complex clan groups of the White-winged Fairy-wren are considerably larger, covering up to 6 ha. For the largest grasswren, the White-throated Grasswren, which is also the largest member of the family, territory size has been estimated at 10 ha. The Purple-crowned Fairy-wren, which lives in the vegetation fringing tropical rivers, maintains linear territories, these extending for 200–300 m along one or both sides of a watercourse. In the non-breeding season, the territory boundaries of Superb Fairy-wrens may be relaxed to some extent, resulting in considerable overlap in the areas utilized by different groups. In the highly seasonal and ephemeral tropical grassland habitats of the Red-backed Fairy-wren, the birds may abandon their territories and congregate in thick vegetation along rivers during the dry season.

Most of the behaviour relating to territory defence takes the form of song battles, especially early in the morning and in the evening. Song given near a boundary is vigorously answered. All members of a group, including females, sing in defence of the territory, and, if trespass does occur, the intruders are vigorously threatened and chased. Intruding females are chased by the breeding female of the territory invaded. A threatening male holds his body feathers and ear-coverts partly erected, his wings away from the body, and his head and tail lowered. R. Hutton saw a similar threat display given by a captive Striated Grasswren, in this case followed by a short "attack flight".

All members of the family are predominantly insectivorous (see Food and Feeding). In the winter months, when insects are less active, the group spends most of each day in foraging, moving throughout the territory. In summer, when insects are abundant and more active, and the daytime is longer, there is time for periods of rest, especially in the middle of the day. The group seeks shade, and the individuals perch side by side, each in body contact with its neighbour, while preening themselves and each other, jostling for a position in the middle of the line. Many of the grasswrens live in arid, often rocky habitats, and they are forced to seek shade under rocks or in crevices, and have been recorded as using even rabbit (*Oryctolagus*) burrows for this purpose.

At the end of the day, after a period of intensive foraging, actively interspersed with territorial song, the group moves to a preferred dense shrub. Here, its members will spend the night, perched in physical contact with one another along a horizontal branch.

## Voice

The vocal repertoire of Australian fairy-wrens and emu-wrens is well known, but the species from New Guinea are not so well known, with few descriptions or recordings. Some vocalizations have been recorded for all of the Australian grasswren species, but the full range and context of these is not always clear. Rowley and Russell provided illustrated sonagrams of the songs of most species in the family. Fairy-wrens and emu-wrens have a clearly recognizable song which is similar in basic structure for all species. The song of the grasswrens is quite different and much more varied in structure. All members of the family have a range of contact and alarm calls, in addition to song.

Fairy-wren and emu-wren song is usually spoken of as a reel. It starts with a few short, high-pitched introductory syllables, descending into a trilled section in which various syllable types are rapidly repeated in strings. The whole song may last for 2–5 seconds, or even longer in the case of some species, and it has a mechanical character, rather than a melodious, musical one. The rate of repetition of the individual syllable types is so rapid that, in most species' songs, they cannot be distinguished, and the human ear hears a continuous sound that rises and falls in pitch. Humans are unable to register differences between the songs of individual birds of the same species, but analysis of sound spectrograms shows that the basic syllables or elements of the songs differ from one individual to another. In studies of the vocalizations of Splendid, Superb and Red-winged Fairy-wrens, playback of recorded song from familiar conspecifics and strange ones has demonstrated that the birds can distinguish strangers from group-members on the basis of song. In the song of the Purple-crowned Fairy-wren, in which the elements are repeated more slowly, it is possible to hear individual differences in rhythm, such as "cheepa-cheepa-cheepa" and "ricketty-ricketty-ricketty".

In the case of fairy-wrens, all adult group-members, including females, sing, and most song is heard early in the morning,



Whereas most malurids tend to live in areas with plenty of undergrowth, the grasswrens (*Amytornis*) often inhabit the opposite extreme. Grasswrens typically live in arid or semi-arid hilly areas, with extensive rocky slopes supporting a liberal layer of spinifex hummock grass (*Triodia*). Such rocky terrain holds insects all year and provides plentiful shelter on hot summer days and cold winter nights alike. The **Kalkadoon Grasswren** neatly fits the mould, inhabiting rocky hillsides, ridges and gulleys in the arid country of north-west Queensland.

[*Amytornis ballarae*, near Mount Isa, Queensland, Australia. Photo: Graeme Chapman]



The three emu-wrens (*Stipiturus*) all need dense ground vegetation up to 1 m tall. This apart, the habitats this trio occupy are distinctly different. The Mallee Emu-wren (*S. mallee*) resides in hummocky *Triodia* grass below low eucalypt (*Eucalyptus*) mallee woodland. The Southern Emu-wren (*S. malachurus*) lives in coastal heaths and swamps. This **Rufous-crowned Emu-wren** is perched in its favourite hummocky grassland, which lies on sand dunes, sandy plains or rocky hills that are sparsely decorated with low shrubs or eucalypts.

[*Stipiturus ruficeps*,  
Lark Quarry,  
SW of Winton,  
Queensland, Australia.  
Photo: Graeme Chapman]



just before and during the breeding season. A song from one territory is generally answered by another from a neighbouring territory. Song is probably an important way of defending the territory and of advertising the fact that it is occupied. In the complex promiscuous mating system of fairy-wrens, in which females seek extra-pair matings by visiting males in nearby territories (see Breeding), song probably also allows females to identify and locate individual males of their choice. With most species, individuals sing alone; even when more than one individual responds to playback of a recording, this does not give the impression of an organized chorus. The territorial song of the Purple-crowned Fairy-wren, however, is more co-ordinated, and the male and female fly to a conspicuous perch and sing there together in a loud reply to a neighbour's song or to playback of a recorded song.

Among Australian fairy-wrens, the loudest songs are those of the "blue group", the Superb, Splendid and Purple-crowned Fairy-wrens. The individual syllables have a complex structure which gives the overall song a harsh, strident quality; the song is also lower in pitch than those of other species, and it can be heard by most people. The songs of emu-wrens are weak and high-pitched, and therefore inaudible to many human listeners. In between these two extremes, the songs of all four members of the "chestnut-shouldered group" of fairy-wrens (see Systematics) are similar to one another in quality, and have simpler elements, a less harsh character and a higher pitch than do songs of the "blue group". The songs of the "bicoloured group" have a simple syllable structure, and that of the White-winged Fairy-wren is typical; this consists of a very characteristic undulating trill, which has been described as musical, but has also been likened to the sound made by a winding fishing reel or a squeaking cart wheel. All the songs may be delivered at what seems to be maximum volume in some contexts. In others they are given very softly, more or less in the manner of a contact call, apparently intended for other group-members which are nearby.

Fairy-wrens feed and move through their territories as a group, and their contact calls are an obvious sign of their presence to anyone trying to locate a group somewhere in 1-2 ha of thick cover. The calls are generally soft and brief, given singly or in a series, and can vary from the strong "chet" of the Purple-crowned Fairy-wren to the very soft "tsi" of the Blue-breasted Fairy-wren, one of the quietest species in the family. Alarm calls are a loud and noisy "chit" or "zit", uttered singly or, if a threat continues,

repeated, sometimes in a harsh chatter. Various other calls have been described, in association with such other aspects as copulation, brooding, and the feeding of young, but there is little specific information on the nature of these calls and their contexts.

The songs of grasswrens are very different from those of fairy-wrens and emu-wrens. They are generally more complex, varied and melodious. The exception is the Grey Grasswren, the only song of which appears to be a series of ringing, high-pitched metallic notes, transcribed as "tsit tsit tsit". Other grasswrens produce a much more complex song, incorporating whistles, trills, buzzes and melodious phrases in a long and varied sequence. Despite their generally secretive nature, the songs of grasswrens, given at dusk or in the early morning, are often delivered from an exposed perch or rock. Contact calls of grasswrens consist of a variety of very high "seeet" notes and soft twittering trills, too high to be heard by many people, and with the source very difficult to pinpoint. Other, more noisy alarm calls are also described for some of the ten species, but the full range and context of the vocalizations of grasswrens are yet to be studied.

As indicated at the start of this section, the songs of the New Guinea malurid species have not been studied, and few recordings are available. The White-shouldered and Broad-billed Fairy-wrens have songs similar to those of their Australian congeners in *Malurus*. The song of the Emperor Fairy-wren is more complex and variable, and incorporates some more melodic syllables likened to those in the song of a European Common Blackbird (*Turdus merula*), in addition to the typical *Malurus* reel. Wallace's Wren and the Orange-crowned Wren are poorly known vocally, apart from the fact that they emit a variety of high-pitched sibilant "see" contact calls as they move rapidly overhead during foraging.

### Food and Feeding

The Australian fairy-wrens, emu-wrens and grasswrens spend most of their life within one metre or so of the ground. They are mainly insectivorous, but for some, especially the grasswrens, seeds and fruits can be a significant component of the diet at some times of the year. Emu-wrens are almost entirely insectivorous.

Dietary studies have revealed that malurids consume a great variety of insects and spiders (Araneae). R. D. Barker and W. J.





This pair of **Striated Grasswrens** are taking shelter from the midday sun by lying in the shade of a grass clump. Many grasswrens inhabit Australia's arid and semi-arid regions, particularly sandy plains, dunes or rocky hillsides. The longer, warmer days of summer mean that insects are active and abundant. In turn, this means malurids have time to rest up and conserve both energy and fluids. Birds use the shade offered by rocks or crevices, and some have been recorded using rabbit (*Oryctolagus*) burrows.

[*Amytornis striatus striatus*, Currumbin Wildlife Sanctuary, Alice Springs, Northern Territory, Australia.  
Photo: Hans & Judy Beste/Lochman Transparencies]

M. Vestjens, in their survey of all the studies of food eaten by Superb Fairy-wrens, listed items from 40 insect families. Ants (Hymenoptera) are a very abundant component of the Australian insect fauna and they form a very significant item in the diet of fairy-wrens, particularly as an important "fall-back" or reserve component in winter, as well as during drought and after fire. The present authors watched as Splendid Fairy-wrens, after an intense fire had destroyed their habitat, foraged along a trail of worker ants, systematically collecting the ants as they ferried their loads back to the colony. When they are feeding their nestlings or fledglings, adult fairy-wrens eat very small items themselves, and carry larger ones, such as grasshoppers and crickets (Orthoptera), cicadas (Cicadidae), and larger moths and caterpillars (Lepidoptera), back to the nest. The small fairy-wrens carry only single food items, but the larger grasswrens can carry several items at once.

It is often suggested that fairy-wrens ingest seeds only by accident, but in some specimens so many seeds have been found that the ingestion of them must surely have been deliberate. Some seeds are probably present in the stomach as a result of the individual having eaten the small fleshy fruits produced by many shrubs of arid and semi-arid regions.

Grasswrens consume significantly more seeds than do fairy-wrens, seeds accounting for perhaps up to half of their diet. Seeds are one dietary component that persists in an arid environment long after the good conditions that produced them have passed. The small seeds of the various species of *Triodia*, the hummock grass, or spinifex, that is characteristic of the habitat of all except three species of grasswren (see Habitat), are one of the important components in their diet, as also are acacia seeds. The relatively fine bill possessed by most grasswrens is well suited for the small grass seeds of *Triodia*. In the case of the Eyrean Grasswren, the large hard seeds of the dune grass *Zygochloa paradoxa* are an important food, dealt with by this species' stout finch-like bill. The habitat occupied by the Thick-billed Grasswren is arid shrubland, rather than spinifex grassland, and this species' bill, heavier than that of the spinifex-dwelling grasswrens, enables it to exploit the larger seeds and fruits of a diverse range of shrubs, including those of the genera *Chenopodium*, *Atriplex* and *Rhus*.

For all malurids, the most common feeding movement on the ground is the "hop-search". This involves a hop with the two feet together, then a pause in order to probe litter or to glean from a leaf or stem, and then another hop or two and a repeated search. When feeding above ground in a shrub, these birds use a similar

pattern, hopping from branch to branch and gleaning from bark or leaves.

Most Australian malurids forage on or near the ground, generally in or below dense vegetation such as shrubs and grasses, either in the understorey of forest or woodland, or in heathland where trees are few. Dense clumps of introduced plants such as blackberry (*Rubus fruticosus*) are a favourite feeding place of some fairy-wrens and emu-wrens in less arid habitats, and fallen trees are popular as foraging sites among forest and woodland species. The birds rarely venture far from cover or from other members of their group. The Purple-crowned Fairy-wren forages slightly higher up, in the prickly *Pandanus* palm fringing tropical rivers, probing among the detritus that collects in the leaf axils and gleaning insects from the fronds and bark. The least terrestrial of the other Australian malurids is the Lovely Fairy-wren, which seeks its food at up to about 5 m above the ground in the thick shrubs and vines of tropical rainforest margins, in regrowth vegetation and even at the edges of mangroves. Most malurids forage as a group, keeping in vocal contact with one another as they move. They spend little time in the open, moving rapidly through open vegetation, and emerging from cover only briefly in order to forage at the edges of shrubs. They sometimes feed temporarily with roving mixed flocks of small insectivores, joining such a flock as it moves through their territory and leaving it at the boundary.

Grasswrens are even more terrestrial than fairy-wrens and emu-wrens. Indeed, most observations of foraging grasswrens refer to these birds as feeding on the ground in the litter that accumulates under shrubs or clumps of *Triodia*. In arid areas, they run across the open ground between the clumps of vegetation, moving so fast that the human observer sees only a blur.

The New Guinea species are less well known. One of them, the White-shouldered Fairy-wren, is similar in morphology to the Australian fairy-wrens and it forages in a comparable manner, by gleaning from low vegetation and from the ground. H. L. Bell studied the foraging behaviour of rainforest birds in New Guinea, and recorded that the Emperor Fairy-wren spent about one-third of its foraging time on the ground or among litter and two-thirds of the time in gleaning on leaves and branches up to 2 m above the ground. The other New Guinea species, the Broad-billed Fairy-wren, Wallace's Wren and the Orange-crowned Wren, display increased adaptation to arboreal foraging, having shorter tarsi and a shorter tail (see Morphological Aspects). They forage at 2–10 m above the ground, where they move through the canopy of tall undergrowth below tall forest with its tangle of vines and

rattans, while gleaning from leaves, probing in cracks, and flying to snatch prey from a surface or to hawk flying insects.

### Breeding

Although the nest-sites and eggs have been described for all members of the Maluridae except the Orange-crowned Wren, little more is known about the breeding biology of most species. All those for which the relevant information is available build a domed nest and lay relatively small clutches of 2–4 eggs. A few species of *Malurus* have been the subject of long-term studies, and their breeding habits are probably better known than are those of any other Australian passerines. What little is known of the more secretive emu-wrens and grasswrens suggests that many aspects of their breeding habits are similar to those of fairy-wrens.

All species in the family appear to be group-living, and probably all of them also engage in co-operative breeding. Co-operative breeding is characterized by the presence of breeding and non-breeding mature individuals in a social unit, or group; the non-breeders are usually referred to as “helpers”, and they contribute to the reproductive effort of the breeding female by feeding nestlings and by caring for fledglings after they leave the nest. Helpers also assist in the defence of the territory and in attacking or distracting predators or parasitic cuckoos (Cuculidae).

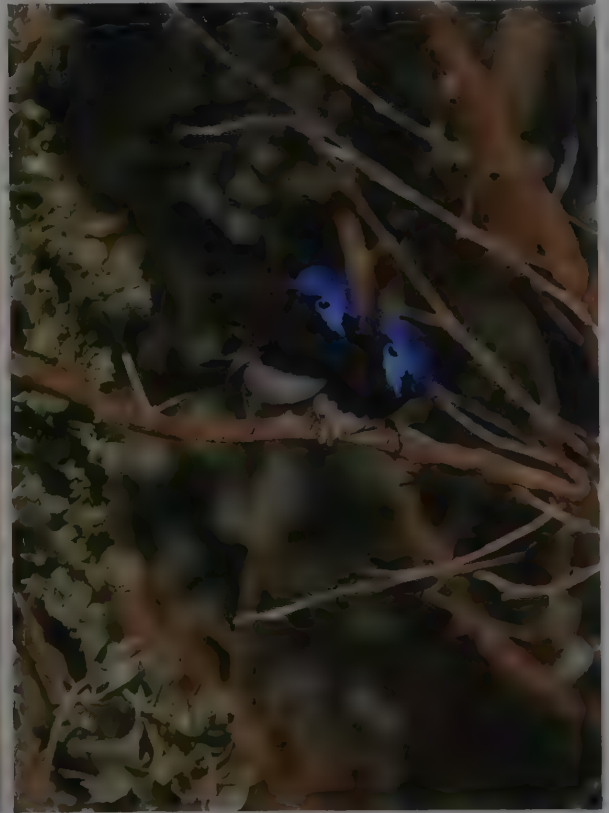
Detailed studies of colour-ringed individuals have identified co-operative breeding by ten species, and, for almost all others, group-living and reports of helpers at nests indicate that they, too, are probably co-operative breeders. All of the Australian fairy-wrens breed co-operatively. Although, for most of the remaining species in the family, the evidence for such behaviour is weaker, the grasswrens, the emu-wrens and the five malurids in New Guinea do occur in groups at all times of the year, which suggests that the young of these species probably delay dispersal. In the case of the White-shouldered Fairy-wren and Wallace’s Wren in New Guinea, more than two individuals have been seen to feed chicks at a nest. In Australia, helpers have been recorded at nests of the Kalkadoon, Black (*Amytornis housei*), Grey and White-throated Grasswrens, and breeding pairs of Thick-billed and Striated Grasswrens occasionally have a third bird with them,

suggestive of co-operative breeding. A study of colour-ringed Southern Emu-wrens has clearly revealed the existence of this behaviour, some male offspring delaying breeding and, instead, helping to raise younger siblings.

For many years, groups of fairy-wrens were regarded as consisting of typical monogamous pairs with their non-breeding offspring. Rowley’s studies of the Superb Fairy-wren in Canberra, in south-east Australia, and of the Splendid Fairy-wren in Perth, in Western Australia, provided the first hints that a very different breeding system was operating. Rowley found that the “Petal-carrying” display recorded in many older reports was performed most often in the presence of a female by a male intruding into another’s territory. He initially suggested that, because the intruder was rarely chased by the resident male, the display had an appeasement function. Further observation of Splendid Fairy-wrens in Western Australia and of Superb Fairy-wrens in Canberra, however, established that in the winter months, before nesting begins, the females are frequently visited by displaying males from other territories, and this phenomenon continues throughout the breeding season. Although this suggested the possibility that females might mate with these intruding males, copulations are observed so rarely that the only way in which to investigate the significance of these courting intruders was to determine the parentage of the young produced by the females. In Western Australia, more than half of all the Splendid Fairy-wren young produced were fathered by males from outside the female’s social group. In another population of the Splendid Fairy-wren, in South Australia, the use of DNA “fingerprinting” to investigate parentage has confirmed a high level of extra-pair paternity, ranging from 24% to 52%, with an average of 42%. This population was at a lower density than that in the Western Australia study. Most offspring were sired by dominant breeding males, but helper males sired about 25% of all extra-pair young. This was most likely to occur when the helper was unrelated to the breeding female, suggesting that incest avoidance constrained mating between helper males and their mothers. A long-running study of the Superb Fairy-wren population in the Australian National Botanic Gardens, in Canberra, undertaken by A. Cockburn and a succession of students and colleagues, has also used DNA-fingerprinting methods to show that, despite the observed mono-

Allopreening, the preening of the feathers of one bird by another, is characteristic of many gregarious species. These two male Variegated Fairy-wrens, both in “Bright” plumage, are preening each other’s head and neck. Although allopreening has been little studied, it appears to serve two purposes. It has a hygienic function, enabling a bird to deal with areas of its body that it cannot reach itself. But allopreening also serves a social function, either enhancing social cohesion of the group, particularly if individuals are related, or maintaining dominance relationships.

[*Malurus lamberti assimilis*,  
Fivebough Swamp,  
New South Wales,  
Australia.  
Photos: Andy & Gill Swash]





gamous social system, Superb Fairy-wrens have a promiscuous mating system, with extreme infidelity between male and female partners. Not only were 76% of all offspring sired by males outside the female's social group, but most of these young were sired by only a small number of preferred males; a few were sired by subordinate males in those groups with preferred males. The females' social partners were, therefore, feeding young to which they were not related.

Although extra-pair copulations were clearly frequent, they were hardly ever observed. In the Canberra study, M. Double and colleagues attached tiny radio transmitters to female Superb Fairy-wrens when they were building a new nest. These females were tracked from before sunrise; they were found to leave their territory and travel directly to a nearby territory, pause briefly, unseen in the dim light, and then to return home just before sunrise. Females made these excursions only in the few days before egg-laying, when they were at their most fertile. DNA analysis indicated that the young that hatched from the eggs laid after these excursions had been fathered by the male of the territory visited by the wandering female.

As most male fairy-wrens look equally beautiful in their blue Bright plumage (see Morphological Aspects) in the breeding season, the Canberra workers looked for what it was that made a few particular males so attractive to females. They discovered that the preferred males shared one distinguishing characteristic. They moulted from the brown Dull plumage into the blue plumage well before the start of the breeding season, and throughout the winter these few Bright males were visiting nearby territories, and there displaying to females. Blue males had elevated levels of the male sex hormone testosterone, which is known to have the side effect of making males more subject to diseases and parasites. In studies by A. Peters, however, it was found that those males that were blue in winter showed no sign of the adverse effects of high testosterone levels, suggesting that they were in particularly good condition. Females that chose to mate with these males were choosing the best possible fathers for their offspring.

A similar high level of extra-pair mating has been established from DNA-fingerprinting studies of the Red-backed Fairy-wren in northern Australia and the White-winged Fairy-wren in Western Australia and South Australia. The size of the cloacal protuberance (see Morphological Aspects) of other Australian fairy-wrens and the recorded occurrence of Petal-carrying displays by most species suggests that they, too, have a similarly

promiscuous mating system. The mating systems of emu-wrens, grasswrens and the New Guinea malurids have not been investigated. Karubian, however, found that male Striated Grasswrens had a relatively small cloacal protuberance and produced lower numbers of sperm, suggesting, for this species, at least, that high levels of extra-pair matings do not occur and that a monogamous mating system is more likely.

Although extra-pair copulations are not uncommon among birds in general, the high frequency of such events recorded in fairy-wrens is rare. Many possible reasons as to why females engage in extra-pair copulations have been put forward, but so far no explanation has received convincing support. One suggestion is that a female mates with a male of higher "quality" than her social partner. Others are that she benefits by increasing the genetic diversity of her brood, or by increasing the chances of genetic compatibility with at least one of her partners. There is some support for the view that extra-pair mating is a means of incest avoidance for species that do not disperse far, and some evidence exists that group-living males that have mated with the group's female are likely to contribute more to the feeding of her brood, so that the female gains a direct benefit from the extra-pair copulations.

The timing of breeding among Australian malurids varies considerably, being influenced mainly by the latitude and by seasonal distribution of rainfall for a particular population. Fairy-wrens in southern Australia breed in spring and early summer; few clutches are laid before September or after the end of December. In more northern, subtropical populations with summer rainfall, breeding may start as early as July or August. With winter rainfall in south-western Australia, Red-winged Fairy-wrens and southern populations of Blue-breasted Fairy-wrens rarely lay before October, and hot dry summers generally render conditions unsuitable for breeding after December. A population of the Blue-breasted Fairy-wren only 150 km to the north-east began to breed about one month earlier, in August. In arid regions, breeding is influenced by rainfall. If conditions allow, seasonal spring breeding occurs, from July onwards depending on latitude, but breeding can take place at any time following adequate rainfall. Rowley and Russell found that the White-winged Fairy-wren breeds in spring in coastal habitat in south-western Australia, which has regular winter rainfall, but in more arid regions this species has been observed to nest in all months except June. After exceptional rainfall, it may continue to breed for as long as conditions allow.



All species of fairy-wren (Malurus) and emu-wren (Stipiturus) have songs that are similar in basic structure. The song of the **Splendid Fairy-wren** is fairly typical, being a rather mechanical "reel" comprising a series of loud, relatively harsh trills, introduced by a few short, soft and simple syllables. The song tends to last two or three seconds. Whilst humans are unable to tell differences between the songs of individuals, studies of the Splendid Fairy-wren and two congeners suggests that birds can distinguish the songs of strangers from those of group-members.

[*Malurus splendens musgravi*, Wyperfeld National Park, South Australia, Australia. Photo: Pete Morris]

Even those species living predominantly in tropical summer-rainfall areas, the Red-backed, Purple-crowned and Lovely Fairy-wrens, exhibit a peak of breeding activity in spring and early summer, although there is some breeding in most months, especially in autumn after summer rain. In studies of the Purple-crowned Fairy-wren, Rowley and Russell found that a good summer wet season was followed by breeding in the autumn, from March to mid-May, and the spring, from July to September, with little, if any, nesting from mid-May to mid-July. In a year with a very poor wet season, however, no breeding was attempted in the subsequent autumn or spring. Although not well studied, the Lovely Fairy-wren of tropical north-eastern Australia appears to breed in most months, including the wet season of December and January. Even in arid areas with regular summer or winter rainfall, the length of the breeding season may be protracted or curtailed, depending on the amount and timing of rainfall.

The few available data on the reproductive behaviour of emu-wrens and grasswrens suggest that these two genera have similar breeding seasons to those of fairy-wrens occurring in the same habitat. Thus, the Southern and Mallee Emu-wrens breed in spring and early summer, and the Rufous-crowned Emu-wren breeds at similar times to the White-winged and Variegated Fairy-wrens living in the same arid areas. Even less is known about breeding seasons of grasswrens, the few records suggesting that the northern species nest during the wet season, generally from November to March or April, and possibly for as long as conditions are suitable. Records for grasswrens in arid inland regions of Australia indicate that breeding takes place in spring if conditions allow, or at other times following good rain. B. Brooker's study of the Thick-billed Grasswren at Shark Bay, at 25° S in Western Australia, where the average May–August rainfall is 200 mm, revealed that eggs were laid in July–September. In the Striated Grasswren population studied by Karubian in inland South Australia, where rain falls predominantly in winter, laying took place from August to December.

Little is known of the breeding habits of most of the malurids in New Guinea. Here, some rain may fall in all months, but the wettest period is from November to April. Information for other insectivorous birds suggests that most breeding occurs before or after the peak of the wet season, although Bell's study of a lowland rainforest community near Port Moresby recorded some breeding in all months of the year.

For the majority of fairy-wrens, the breeding season is long enough for pairs to produce two broods, or sometimes even three,

or to rear the young of a parasitic cuckoo and still have time for two broods of their own. The shorter reproductive season of the Red-winged Fairy-wren in south-western Australia allows fewer females to raise more than one brood; females which failed with the first nest had sufficient time to nest again, but only those females which began nesting on an earlier date than the average had time for a second brood after a first succeeded. A female may be able to produce more broods within the limits of the breeding season if helpers are present in the group, as these can take over the care of some of the fledglings. In the study by Rowley and others of the Splendid Fairy-wren in south-western Australia, it was found that, in groups with two or more helpers, females laid their next clutch almost two weeks after the previous brood fledged or even sooner, whereas females with no helpers looked after fledglings for about one month before laying their next clutch.

The displays performed by intruding males before and during the breeding season exploit the bright colours of their iridescent plumage, including the erectile contrasting feathers of the scapulars, mantle and nape. Those males which possess elongated erectile ear-tufts incorporate these, too, in displays. A common element in many displays is the "Face-fan", when the elongated iridescent ear-tufts are erected, projecting on each side of the head. The malurid displays which have been most closely observed are those of the Superb and Splendid Fairy-wrens, and they have many features in common, as summarized by Rowley and Russell for the Splendid Fairy-wren and by Mulder for the Superb Fairy-wren. Only very rarely are these displays given by a male to a female in his own territory. Displays are given only by males in Bright plumage (see Morphological Aspects). In a typical sequence, a male Superb Fairy-wren approaches a female while performing the Face-fan, and holding the tail lowered, the crown feathers flattened and the feathers of the nape and mantle fluffed out; he twists from side to side, displaying the contrasting colours of his plumage in the "Blue and Black" display, the term used by E. Bradley and J. Bradley in 1958. R. Hutton named a similar display that she saw performed by the Splendid Fairy-wren in aviaries as the "Lizard" display, because the erectile feathers around the neck were reminiscent of the frill of a frill-necked lizard (*Chlamydosaurus kingii*). When departing from a territory after displaying to a female, a male often continues his display as he flies off, flying with his body held erect and the tail lowered. Rowley, having initially referred to this as "Impeded flight", later termed it "Sea Horse flight", because of the vertical body pos-

The song of the grasswrens (*Amytornis*) is very different from those of the other malurid genera, being more complex, melodious and varied in structure. Species such as the **Carpentarian Grasswren** integrate trills, whistles, buzzes and sweet-sounding phrases in a long sequence, which is most often given in the early morning. Surprisingly for such a skulking genus, grasswrens tend to sing from exposed perches such as a rock. Grasswrens also have a variety of contact calls, including high-pitched, cricket-like chirps and twittering trills.

[*Amytornis dorotheae*, 20 km south of Borroloola, Northern Territory, Australia.  
Photo: Graeme Chapman]







ture reminiscent of that of that extraordinary marine fish, the sea-horse (*Hippocampus*).

Those male fairy-wrens which have the scapulars and mantle feathers of a striking colour, and sometimes elongated, make full use of these plumage parts in displays. In the case of the Red-backed Fairy-wren, which has no contrasting ear-tufts, the red feathers of the mantle and scapulars cover the lower back and uppertail-coverts, and are erectile, so that, when raised in display, they make the male look like a red-and-black powder-puff, especially striking in the Sea Horse flight. In another display, male Red-backed Fairy-wrens hold their primaries close together and depress the wings slightly, thereby exposing the striking red colour of the back, while at the same time erecting the black crown feathers. Displays of White-winged Fairy-wrens emphasize the contrast of the overall dark blue plumage with the brilliant white of the scapulars, secondary wing-coverts and innermost flight-feathers, both in display-flights and in perched displays, when the back is exposed.

In some of their displays to females, intruding males augment their plumage display with the striking addition of a coloured petal. These displays are seen mainly during the breeding season and in the two preceding months, and have been observed for eight of the nine Australian fairy-wren species, the male picking and carrying a flower petal or fruit, of a colour that contrasts with its own plumage. Most such records refer to the Superb Fairy-wren, which carries yellow petals, and the Splendid Fairy-wren, which carries pink, blue or purple ones, with an occasional yellow or white petal. Other fairy-wren species that have been observed carrying petals are the Red-winged (yellow and white petals); Variegated (yellow); Blue-breasted (orange); Lovely (yellow); White-winged (purple, blue, yellow and white); and Red-backed (orange, red and yellow petals, and red berries). Mulder scored Petal-carrying in about 20% of displays to females by intruding male Superb Fairy-wrens. The resident male may be present during visits by displaying intruders, sometimes chasing the intruder out of the territory, but in many cases making no attempt to do so. Although studies of the Red-backed Fairy-wren found that most Petal-carrying displays are directed at a female, suggesting that they have a courtship function, females generally show little interest in the displaying visitor, and avoid him if he pursues. Displays by intruders do not generally lead to copulation.

Malurid copulation is rarely witnessed by human observers, but the few accounts, relating to a number of species of fairy-wren, indicate that it is brief, with little or no preceding display.

The female soliciting copulation crouches, and flutters her wings. If the male is not close by, she sings before soliciting, at which the male immediately approaches and mounts her. Coition takes only a few seconds, and it is easy to understand how a female seeking extra-pair copulation can visit a male in another territory, copulate and return home very quickly; in the dim early-morning light, when such forays occur, females can presumably identify and locate individual males by their song. A similar wing-fluttering display is also given in other contexts, by a juvenile begging food from an adult, by a helper giving way to an older individual when approaching a nest with food, or by a young male to an older male.



The Maluridae mainly eat insects and spiders, and the Superb Fairy-wren has been found to consume insects from 40 families including grasshoppers, shield-bugs, flies and weevils. Ants form a significant part of the fairy-wren diet. An abundant component of the Australian outback, they are an important staple, particularly in winter, during drought and after fire. Fairy-wren stomachs have also been found to contain seeds, but is unclear whether they ingest these by accident or with intent.

[*Malurus cyaneus cyanochlamys*, Rushworth State Forest, Rushworth, Victoria, Australia.  
Photo: Andy & Gill Swash]

The Australian malurids spend most of their life within a metre or so of the ground, so it is not surprising that they mainly feed terrestrially. Fairy-wrens, such as this Red-backed Fairy-wren, hop along open ground or forage under shrubs, pouncing on prey when they spot it, probing litter or gleaning from a leaf or stem. When feeding off the ground in a shrub, birds hop from branch to branch, gleaning from leaves or bark. The Red-backed Fairy-wren also "flutter-chases" through vegetation in order to disturb prey, which it then pursues.

[*Malurus melanocephalus melanocephalus*, Moggill State Forest, near Brisbane, southern Queensland, Australia.  
Photo: Raoul Slater/  
Echman Transparencies]

When feeding nestlings or fledglings, adult fairy-wrens (*Malurus*) differentiate between food for themselves and those for their offspring. The adults eat only very small prey themselves, taking larger items, such as cicadas, grasshoppers and crickets, back to the nest. This adult male **Splendid Fairy-wren** is carrying a caterpillar, and may well be taking it to his chicks. This species, like other malurids, forages in small groups, whose members call to one another as they move through dense vegetation.

[*Malurus splendens melanotus*,  
Hattah Lakes,  
north-western Victoria,  
Australia.

Photo: Hans & Judy Beste/  
Lochman Transparencies]



Few displays by emu-wrens and grasswrens have been recorded. Hutton described a captive male Striated Grasswren as feeding the female frequently during the week before mating and egg-laying. When the female is ready to accept mating, she wing-flutters; the male hops up and down briefly in front of her, and then mounts. Courtship and mating by the Southern Emu-wren follow a similar course. In addition, feeding of the female by the male Thick-billed Grasswren has been documented.

With the single exception of the Orange-crowned Wren in New Guinea, the nests of all members of the family have been described. The majority of malurids build a domed nest, taller than it is wide, with a slight hood over the entrance, which is about two-thirds of the way up on one side. Among fairy-wrens, the largest nests are those of the Purple-crowned, which are, on average, 15.2 cm high and 10 cm wide, and are placed about 90 cm above ground; these bulky nests look like a pile of flood debris in *Pandanus* palms growing at the edges of tropical rivers. Not surprisingly, the smaller species build smaller structures, such as the neat, tightly woven nests of Variegated and White-winged Fairy-wrens, which measure about 10 cm by 6.5 cm, and are sited about 20 cm above ground in low shrubs. The nests of emu-wrens are similar in size and structure to those of the smaller species among the fairy-wrens. Some grasswren nests are fully domed, like those of the Striated, White-throated, Carpentarian and Kalkadoon Grasswrens. Others are more variable, as is the case with the Thick-billed Grasswren, some nests of which are almost an open cup, others having a partial hood and still others a complete hood with a side entrance. The biggest malurid nests are those of the larger grasswrens, such as the White-throated Grasswren. The nest of this species has dimensions of about 16–18 cm by 12–14 cm.

Few nests of any malurid species are built more than 1 m above ground, where they are placed up to 0.5 m from the outer surface of a shrub or bush. Their openings often face in a direction away from the afternoon sun or from prevailing winds or rain. Nests are frequently placed higher above ground later in the breeding season, when the weather is usually hotter. In the case of the Blue-breasted Fairy-wren, for example, those in September–October were close to the ground, about 25 cm up, in piles of dead brush, whereas nests built after mid-November were about 62 cm above ground within the canopy of live green bushes. At any one site, the majority of any malurid's nests are built in one or two favoured species of shrub. Superb Fairy-wrens inhabiting agricultural and urban areas utilize a variety of exotic shrubs and weeds such as blackberry, and hawthorn (*Crataegus*). Emu-wrens

and grasswrens living in arid habitats nest within mature spinifex clumps, which afford great protection, while the coastal emu-wrens often use clumps of sedges and tussock grasses.

Nest-building is undertaken solely by females, which at this stage are often accompanied by their male partner, and are visited by intruding males. The construction is begun with a framework of grass and strips of bark, held in place with spider web. Walls and a roof of finer grass and fibre are added, and the nest is lined with fur, feathers and vegetable down. Some of the species inhabiting high-rainfall tropical regions sometimes incorporate moss into the roof, which may help to keep the nest dry.

The eggs of all malurids are very similar to each other in appearance. They have a tapered oval shape, and in colour they are dull white or pinkish-white, spotted with red-brown, the spots especially evident at the blunter end. The most densely spotted eggs are found in clutches of the Grey, Thick-billed and Dusky Grasswrens. In contrast, those of the Black Grasswren are the least patterned. Egg size increases with the body size of the female, and ranges from an average of 15 × 11 mm, as with the smallest emu-wrens, to 22 × 16 mm, as the eggs of the Black and White-throated Grasswrens. An even smaller egg, 13.5 × 9.5 mm, has been described for Wallace's Wren, but so far only one measurement of an egg known for certain to have been laid by this species has been recorded. The eggs of the small emu-wrens are large in relation to body size, corresponding to about 20% of the female body mass; by comparison, those of the largest grasswren, the White-throated, are only about 9% of the female body mass.

Clutch sizes are small and show little variation. Most Australian fairy-wrens and emu-wrens lay clutches of two to four eggs, with three the most frequent number. No four-egg clutches have been recorded for the Purple-crowned, Blue-breasted or Red-winged Fairy-wrens, and, among Red-winged Fairy-wrens, clutches of two eggs are slightly more frequent than are clutches of three. In the case of White-winged Fairy-wrens, clutches of three and four were equally frequent in coastal south-western Australia, and studies in other areas have reported a mean clutch size of slightly greater than three. Among the emu-wrens, the larger, coastal Southern Emu-wren lays two to four eggs, with three the most common clutch size, whereas the tiny Rufous-crowned Emu-wren of the arid interior most frequently lays two eggs but occasionally three. Few of the grasswrens have been studied in detail, but information from egg collections suggests that, in this genus, clutches consist of two or three eggs, with two the more common number. For the Thick-billed Grasswren at Shark Bay, in Western Australia, Brooker found that the mean



clutch size was 2-7, with three eggs the most frequent. Among the little-known New Guinea malurids, clutches of two eggs are usual.

The clutch size of fairy-wrens so far studied varies little during the course of the breeding season, and exhibits no sign of variation with latitude. Blue-breasted Fairy-wrens, however, usually lay a first clutch of three eggs, but clutches laid later in the season or in years when rainfall during the breeding period is low may consist of only two eggs.

Fairy-wrens and emu-wrens lay at intervals of one day. Although it has been assumed that the same applies to grasswrens, the Thick-billed Grasswren has been reported as laying at two-day intervals.

Among the fairy-wrens, only the female incubates, starting when she lays the last egg of the clutch. She sits facing the entrance of the domed nest, and, in the confined space, the tips of her long tail feathers develop an obvious bend to one side or the other. Bouts of incubation last for about an hour. The female may leave the nest in response to a song by the male; alternatively, she may leave, and he will appear in response to her song. During recesses from incubation, she forages very urgently, without pause, close to the male, while he remains vigilant and forages little. The female moves away from the nest as she forages, and her return to it is made in a long, low, direct flight. The incubation period of fairy-wrens is typically 13-15 days. In the Splendid Fairy-wren study carried out by Rowley and others, the duration of incubation ranged from 12-13 days to 16-17 days, most clutches hatching on the fifteenth day of incubation. For most species of *Malurus*, incubation in the summer months of December and January lasts about one day less than it does earlier in the season. In captivity, the male has been seen to bring food to the female on the nest, but this has not been recorded in the field.

Aviary observations of emu-wrens and grasswrens suggest that the males occasionally incubate for a short period. Field observations confirm this.

Nestling fairy-wrens hatch within 24 hours of each other. They are initially naked and blind, and red in colour, darkening within one day and becoming blue-grey as the feathers develop beneath the skin. Chick growth is rapid, and on the third day the primary feathers begin to protrude through the skin. The eyes are usually open on the sixth day, when the primaries start to burst from their

sheaths and the rectrices begin to emerge; by the seventh day the body feathers, too, are starting to emerge. By the time when they leave the nest, at 11-12 days of age, the young are well feathered but the tail is still very short, less than one-quarter of its final length, which is not attained until 40-45 days after hatching; the wings too, are not fully grown, and they continue to grow for a further ten days. The young, on leaving the nest, can fly only weakly, and for 7-10 days they remain well hidden in thick vegetation until the wings have finished growing, the tail is about half-grown, and they are able to fly better. No sexual differences are apparent at this stage.

Grasswrens are covered with charcoal-grey down on hatching. Other aspects of their growth and development have been little studied, but reports suggest that the chicks leave the nest 10-15 days after hatching and remain cryptically concealed for about one to two weeks thereafter. It is not clear whether male and female grasswrens are distinguishable from one another at this early stage of their life. Emu-wrens hatch with tufts of blackish down on the head, shoulders and tail. In the case of the Southern Emu-wren, differences between the sexes are apparent in the nest; the male's throat is pale blue-grey and the female's is reddish-brown.

Once malurid nestlings hatch, the male and female, together with any helpers associated with the pair, begin to carry food to the nest. At first, the breeding female broods the nestlings almost continuously, and she takes food brought to the nest, eats some of it and passes some on to the nestlings. Later, when more of the chicks' feathers have emerged, she leaves the nest for increasingly long periods, and attendants deliver the food directly to the young and remove their faecal sacs. The contribution of individual group-members is very variable. The breeding female usually makes the greatest contribution; if she has only one male to help her, however, he may contribute nearly as much as she does. Helpers can reduce the amount of work done by the breeding female, and when female helpers are present, as is so in the case of Splendid and Red-winged Fairy-wrens, they often provide nearly as much food for the nestlings as does the breeding female. When a single male helper is present, the senior male reduces his contribution, and there is little effect on the work done by the breeding female. In larger groups, those with two or more helpers, the total feeding rate does not increase significantly, but the contribution of each individual is lower. Young helpers, in



Whilst fairy-wrens (*Malurus*) and grasswrens (*Amytornis*) consume at least some seeds and fruits, emu-wrens are almost entirely insectivorous.

The exception appears to be the **Mallee Emu-wren**, which is reported sometimes to eat seeds. Emu-wrens forage by hopping on the ground, searching for food with the tail held erect, or gleaning in shrubs and clumps of *Triodia* hummock grassland within a half a metre of the ground. Like its congeners, the Mallee Emu-wren lives in small groups, apparently family parties, for most of the year, and may join foraging flocks outside the breeding season.

[*Stipiturus mallee*,  
Hattah-Kulkyne National  
Park, Victoria, Australia.  
Photo: Graeme Chapman]

Grasswrens are unusual among malurids in that seeds form a high proportion of their otherwise insectivorous diet. The short, deep bill of most species is an adaptation to eating seeds. The **Eyrean Grasswren** takes this trait to an extreme, its large bill being thought to have evolved to deal with the large seeds of sandhill canegrass (*Zygochloa paradoxa*). The Eyrean Grasswren gets all its water requirements from its food — a useful adaptation to desert life.

[*Amytornis gowderi*,  
C Australia.  
Photo: ANT/NHPA]



the first breeding season after the one in which they hatched, are only 9–12 months old, and some of them feed nestlings assiduously, whereas others make little contribution; older helpers are more constant in their effort. With species which commonly produce second broods, such as the Splendid and Superb Fairy-wrens, immatures from a first brood may help to feed a later brood. Their visits are usually infrequent, they deliver small items, and they may even beg from adults bringing food to the nest.

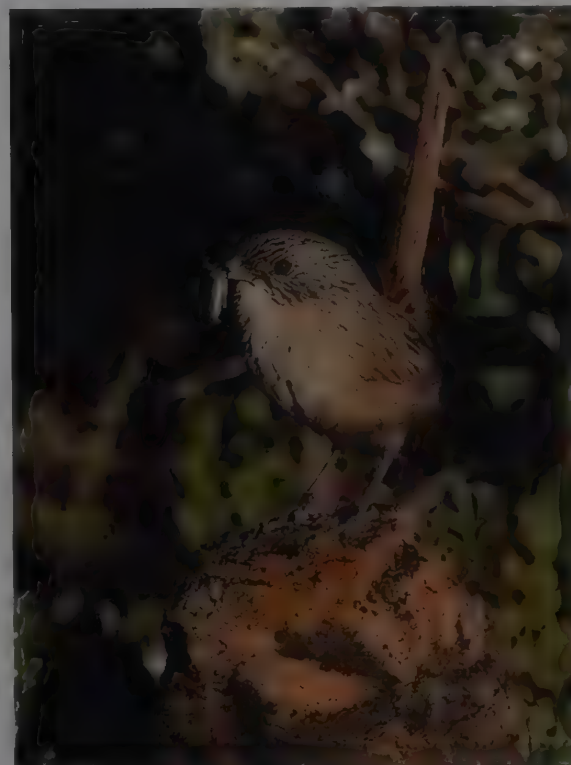
Many attempts have been made to explain the presence of helpers at nests of birds, to shed light on the reasons why individual birds capable of breeding choose, instead, to remain with their parents and to feed the young of other adults. Most explanations recognize that there has to be some benefit for the helpers, something that balances the latter's own forgone potential reproduction. This benefit may be indirect, if the helpers are assisting their parents to rear nestlings with whom they share genes, a so-called "kin benefit"; or it may be direct, with some positive benefit to the helper, and also to the parents for allowing the helper to stay. With malurids, there is little evidence of indirect benefits, since the helpers have no great effect on the production of fledglings, and extra-pair copulations further reduce any kin benefit. On the other hand, several direct benefits for helpers and breeders have been identified among malurids. Helpers reduce the amount of work done by the breeding female and her partner in feeding nestlings; studies of fairy-wrens in Canberra have shown that this frees the dominant male from parental duties and allows him to spend more time in visiting females in other territories and seeking extra-pair copulations. Another possible direct benefit is an improved chance of gaining a breeding territory in habitats in which all good territories are occupied throughout the year. Long-term studies have revealed that male Splendid Fairy-wrens that stay at home are likely to fill a vacancy for a breeder either in their natal territory or in an adjoining one, and their best chance of surviving to do this is to remain in their familiar natal territory.

Having left the nest, young malurids are fed by their parents and other adults in the group for about one month. After they become independent of parental feeding, they remain with the group, joining in group activities. Some young females may disperse early in the autumn, whereas others remain with the group through the winter, and disperse in late winter and early spring. Both males and females are sexually mature and capable of breeding at one year, although not all at that age have become established in a territory with a partner. Those that are not paired may remain as helpers, generally in the natal territory, and among many malurid species a significant proportion of males and some fe-

males do not breed until they reach two years or even more. Because of the promiscuous mating system, young males paired for the first time are more likely to be cuckolded. In the case of the Red-winged Fairy-wren, with high survival of breeding adults and few new vacancies for breeders, the median age at first breeding was three years for both males and females.

For fairy-wrens, the major causes of nest failure are predation and brood parasitism, the latter by cuckoos. Desertion is a relatively minor cause of failure, rarely affecting more than 10% of nests, and can be due to rain, excessive cold or heat, or predation of the female. Considering all species in the family Maluridae, parasitism by cuckoos has ranged from 0% to 36%, with 10–20% the usual range. The majority of parasitism of most species is by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*), and in tropical Australia the Purple-crowned, Variegated and Red-backed Fairy-wrens are hosts of the Brush Cuckoo (*Cacomantis variolosus*); several other cuckoos have been recorded occasionally as nest parasites of fairy-wrens, grasswrens and emu-wrens. In addition to causing the complete failure of host nests, cuckoos are significant nest predators of fairy-wrens. Although Horsfield's Bronze-cuckoo is able to lay eggs in the nests of Superb Fairy-wrens, and these eggs are then incubated to hatching, one study in Canberra has shown that as many as 40% of nests containing a lone Horsfield's Bronze-cuckoo chick were deserted by the Superb Fairy-wren owners; the latter is a species which rarely deserts its own nestlings.

Despite the supposed protection offered by the domed nest structure, nest predation is a significant cause of failure, ranging from 9% in one population of the White-winged Fairy-wren to 55% in another, and accounting for a failure rate of 55% recorded for the Superb Fairy-wren in Canberra. Predators include snakes and lizards, rats (*Rattus*), feral cats and foxes (*Vulpes*), and a variety of birds, such as the Pied Currawong (*Strepera graculina*) and the Grey Shrike-thrush (*Colluricincla harmonica*). The success of nests varies both within and among species, and year-to-year variation can be considerable. Over a 17-year study of the Splendid Fairy-wren near Perth, in southwest Australia, the proportion of clutches from which young fledged ranged from 30% to 86%, with an average of 57%, and the average rate of cuckoo parasitism was 20%. In populations of other species with low levels of cuckoo parasitism, the success rate of nests is higher, 68% in the Red-winged Fairy-wren



Being even more terrestrial than other malurids, grasswrens (*Amytornis*) forage almost exclusively on the ground, in the litter lying under and around the bases of shrubs or clumps of spinifex grass (*Triodia*). Birds hop or run but rarely fly; they carry the tail cocked, bouncing over the ground between patches of vegetation, where they glean for food. The stocky bill of the appropriately-named **Thick-billed Grasswren** is a morphological adaptation to eating seeds. But, as seen here, the bill dimensions do not prevent it from catching and consuming insect and other invertebrate prey.

[*Amytornis textilis modestus*,  
25 km E of Lyndhurst,  
South Australia, Australia.  
Photo: Graeme Chapman]





Most malurids build a dome-shaped nest, taller than it is wide, with a slight hood over an entrance hole located towards the top on one side. Usually only the female builds the nest, but sometimes she is accompanied by her partner – or even attended by a rival male hoping for a swift copulation. This female **Lovely Fairy-wren** is putting the finishing touches to her nest. Nests are made out of twigs, grass, rootlets, and bark. The Lovely Fairy-wren's nest has moss in the roof, perhaps to keep the nest dry in the species' wet rainforest habitat. Nests are generally placed no more than a metre above ground, suspended from a horizontal branch in the interior of a bush or shrub. Later in the breeding season, when it is hotter, birds may nest higher up where it is slightly cooler.

[*Malurus amabilis*, Innisfail, northern Queensland, Australia. Photo: Hans & Judy Beste/Lochman Transparencies]

and 88% in the coastal White-winged Fairy-wren. In two other studies of White-winged Fairy-wrens, both in drier areas and with a greater degree of parasitism by cuckoos, only 28% and 36%, respectively, of nests were successful.

For most malurids, the productivity per nest is 1–2 fledglings, but because the breeding season is long, and because females re-nest after fledging one brood and re-lay repeatedly after failure, the number of young successfully reared by a pair or group over the whole breeding season is a more significant measure of productivity. Individual pairs or groups of fairy-wrens produce an average of 2–3 fledglings per year, significant numbers of females raising two broods, and with occasional records of three broods. In the population of Splendid Fairy-wrens near Perth, over the 17 years of the study, approximately 20% of females produced two broods and, perhaps more significantly, an average of 85% of groups had at least one successful nest per year; in no year did the latter figure fall below 65%.

At least half of all fledglings leaving malurid nests survive to become independent of their parents after one month, and studies of several species have demonstrated that 25–40% of fledglings live to one year or more. In a study of the Southern Emu-wren at Portland, in Victoria, it was found that females, although capable of producing more than one brood per season, rarely did so. This was because of high rates of nest failure and of loss of nesting females, both a result of predation by snakes.

The mortality of adults varies with species and habitat, but is remarkably low for such small, brilliantly coloured birds. In populations of Red-winged Fairy-wrens from the high-rainfall eucalypt forests of south-western Australia, 78% of breeding adults survive from one breeding season to the next, and the maximum recorded longevity is at least 17 years for a male. Among other malurids that have been studied over several years, adult survival has been found to be in excess of 60%.

## Movements

For most malurids, few data about movements are available from studies of individually marked birds, but there is no information from any source to suggest that any of the 27 species is anything other than resident. In studies of marked individuals, it has always been found that breeding pairs or groups are resident in a territory throughout the year, some young dispersing from the natal territory in their first year or later. This pattern probably applies to all members of the family.

In the case of the Superb Fairy-wren in Canberra, in south-east Australia, all young females disperse in their first year, in two distinct phases. Some females leave early, mostly 1–2 months after they fledge, and their dispersal is not in response to any obvious aggressive behaviour by the group; these females are most likely to be some of those hatched early in the breeding season. The second phase of dispersal takes place shortly before the next breeding season, and occurs in response to persistent maternal aggression. Early-dispersing females travel much farther than do those dispersing later; the longest movement recorded in Canberra was made by a female found breeding, in the year following her hatch, at a site 8 km from her natal territory. Late-dispersing females did not move so far, and took over breeding vacancies that had become available. While some early-dispersing females found breeding vacancies, others joined another group and remained with it through the winter before dispersing again to find a breeding vacancy. Since no "floating" females occur in the population, it appears that females unable to join a group do not survive. Males generally do not disperse, unless to occupy a breeding vacancy that becomes available in a territory nearby. Many males inherit their natal territory, remaining as helpers (see General Habits, Breeding) until they replace the dominant male. Although most relationships were ended by

the death of one of the breeding pair, some females initiated divorce by dispersing to another territory. Occasionally, this was to a better-quality territory with more helpers. In other cases, it occurred when the female became paired to her son after the death of a previous senior male, or when a son was the senior helper; in such circumstances, the dispersal can be interpreted as a means of incest avoidance.

Among other fairy-wrens, dispersal follows a similar course, unless above-average productivity and high survival of juveniles and adults lead to increasing competition for a few breeding vacancies. In the relatively benign forest habitats of south-western Australia, about 80% of breeding adult Red-winged Fairy-wrens survive to the next nesting season, and most females do not disperse until their second year. This leads to larger groups and to the occurrence of helping behaviour by females, something that is not generally found in such species as the Superb Fairy-wren, all females of which disperse in their first year. It is likely that later-dispersing individuals make exploratory forays from the natal territory, remaining in a new territory if they encounter a vacancy or returning home if none is located.

Studies of the Splendid Fairy-wren in south-western Australia revealed that, when a run of good seasons produced a large excess of one-year-old and two-year-old males and females and there were few vacancies for breeders, many females did not disperse until their second or third year. Instead, they remained as helpers in the natal territory, and some even attempted to breed there. After a series of fires significantly reduced productivity and survival, fewer birds were available to fill more breeding vacancies, so that most females dispersed in their first year, and few groups had female helpers.

One of the best-examined examples of dispersal is that of the Blue-breasted Fairy-wren studied by M. G. and L. C. Brooker in south-western Australia. Throughout most of this species' range, clearance for agriculture has removed all but a small proportion of its habitat, and what remains in the Western Australian wheatbelt is fragmented, often degraded, and isolated from other such remnants. Nevertheless, the Blue-breasted Fairy-wren persists in this habitat. In a study of its dispersal, the cleared habitat with fragments of native vegetation made it possible to locate most of the dispersing individuals. Males tended to be philopatric, only about one-third of young males dispersing in their first or later years. Those that dispersed rarely moved farther than the next territory, particularly in larger remnants of habitat. On the other hand, nearly half of the young females dispersed in their first year, and a further 16% did so in subsequent years. The median dispersal distance, measured as a straight line, was 1.2 km, and the farthest recorded straight-line distance was 8.8 km, or 13.8 km via the shortest possible route that followed vegetation "corridors" between the two sites. Since dispersing females are not familiar with the landscape and need to explore many options, however, the total distance traversed is probably much greater. In this study, it was calculated that the fairy-wrens rarely crossed a gap of more than 60 m, so that females dispersing in fragmented habitat might need to travel many times the distance covered by a female in unfragmented habitat, at the same time crossing gaps in vegetation. This implies a greater risk to dispersing females, and female mortality is, in fact, greater than that of males. It also implies that Blue-breasted Fairy-wrens will be reluctant to disperse to fragments isolated by more than 100 m of cleared land unless a vegetation corridor exists. These factors could lead to the decline of the species in habitat with inadequate connections between fragments. The study showed that a once continuous population is now a series of isolated subgroups.

For all malurid species hitherto studied, movement by breeding adults is uncommon, and occurs in one of two contexts. The first is in the rare cases of divorce, when an individual leaves one mate and territory for another, and the second is after a mate has died, and the survivor then moves to a vacancy in another territory. These movements rarely traversed more than one or two territories. There is so far no evidence to indicate that quality of mate or of territory is a factor responsible for any dispersive movements.

The few studies carried out on emu-wrens and grasswrens suggest that these, too, are resident throughout the year in all-

purpose territories. Studies of such species as the Grey Grasswren from arid central Australia suggest that in times of prolonged drought, when little vegetation cover remains, territory boundaries are relaxed and surviving individuals from a number of territories congregate in a few refuge areas of persistent vegetation.

## Relationship with Man

Fairy-wrens are one of the most widely known and recognized genera of Australian birds, while emu-wrens and grasswrens are probably among the least known. The brilliant colour of the male fairy-wrens, combined with the habit of *Malurus* species of foraging on the ground in relatively open areas, their persistence in many modified habitats so long as sufficiently dense cover remains, and their easily identifiable song, means that they are among the few birds familiar to people beyond the birdwatching community. Fairy-wrens in large suburban gardens and in parks can become very tame and, if food such as cheese or peanut butter is provided, they will come to a bird feeding station, thus adding to their general appeal. "Blue wrens" as a category are, along with kookaburras (*Dacelo*), Australian magpies (*Gymnorhina*), magpie-larks (*Grallina*), parrots (Psittacidae), cockatoos (Cacatuidae), Willie Wagtails (*Rhipidura leucophrys*), crows (Corvidae) and ducks (Anatidae), one of the general bird groups recognized by most Australian residents. The distinctions among species are not generally made by the lay public, who are familiar with local species and are surprised to find different ones in other parts of Australia. These fairy-wrens have achieved the status of cultural icon, one of the necessary species in any decorative art with a wildlife theme, obligatory in bird calendars, popular wildlife books for children, and the tourist souvenir and postcard trade. This recognition has meant that they are one of the first species enlisted in attempts to gain public support for the preservation of remnants of native vegetation on the fringes of towns and cities.

Several members of the family have been kept in captivity. These include emu-wrens and grasswrens, as well as fairy-wrens. The very attractive plumage of some of these species could per-



Emu-wrens (*Stipiturus*) breed in monogamous pairs, the female assuming most of the breeding responsibilities. She constructs the nest, a domed ovoid with a side entrance, more spherical than those of fairy-wrens (*Malurus*). It is loosely woven from grass and moss, lined with feathers and plant down, and hidden in a grass tussock. The female usually lays three eggs and incubates them alone. Both parents, however, feed the chicks when they hatch after a couple of weeks. This male Southern Emu-wren—sexed by the blue on his breast and throat, and above his eye—has just brought insect prey for his growing offspring.

[*Stipiturus malachurus malachurus*, Mallacoota, SE Victoria, Australia. Photo: Hans & Judy Beste/Lochman Transparencies]



haps explain why people would wish to keep them in captivity, but it is debatable whether they could be considered to make good household pets. On the other hand, observations on aviary-held malurids have provided some useful information on various aspects of the behaviour of these birds.

### Status and Conservation

Despite the ability of some malurid species to persist in both modified and man-made habitats, the changes in the Australian landscape wrought since the arrival of Europeans have reduced the range and numbers of all members of the family. The widespread land clearance for agriculture and the large-scale logging of forests for timber production in higher-rainfall areas have greatly reduced the area of land available to malurids, both in Australia and in New Guinea. While some large trees may be left when land is cleared for agriculture or forestry, without an understorey there is no suitable habitat for malurids. Urban settlement in the region clings to the coastal fringe, and the inexorable development of coastal lands for new houses has consumed much of the coastal swamplands and sandy heathlands that were the habitats of the various subspecies of the Southern Emu-wren. Some habitat remains in reserves and national parks, but the increasing fragmentation of remnants is a focus of much conservation effort. In agricultural areas, this is of particular significance to malurids, which have relatively weak powers of flight.

Other modifications of habitat have also been of particular significance to malurids, because these are species that forage mainly on the ground or in low vegetation (see Food and Feeding). Much of the uncleared remnants of native vegetation and roadside vegetation in agricultural landscapes has been seriously degraded by grazing, fire, weed-control spraying and increased salinity. In forest habitats, not only is logging activity a problem, but frequent low-intensity burning is also carried out as a means of protecting forests from uncontrollable high-intensity wildfires. These "fuel-reduction" fires have an adverse effect particularly on resident, weak-flying understorey species such as the fairy-wrens; this is significant since, with increased human population density and access to forests, greater numbers of accidental and deliberately lit fires are occurring, chiefly in areas close to major population centres. The overall increase in fire frequency can lead to a decline in both productivity and density of fairy-wren populations.

A further significant interaction is with exotic animals, in particular foxes, cats and rats, brought to Australia by humans. All of these introduced mammals are significant predators of birds and their nests, and they have spread to most parts of Australia, including the arid areas. Domestic cats are significant predators, especially on the fringes of cities and towns. In south-eastern Australia, introduced birds such as the Common Blackbird, the Song Thrush (*Turdus philomelos*) and the Common Myna (*Acridotheres tristis*) may be competitors of the Superb Fairy-wren.



It was long thought that fairy-wrens (*Malurus*) bred monogamously, helped by their non-breeding offspring. Research has revealed a rather different reality. Several species of fairy-wren studied, including the **White-winged Fairy-wren**, turn out to be socially monogamous, yet sexually promiscuous. While extra-pair copulations are not uncommon among birds, their high frequency in fairy-wrens is exceptional. Females often produce offspring sired by males in the group other than their partner, or by displaying males from adjacent territories. Females appear to prefer males that moult from their "Dull" brown plumage into their "Bright" garb well before the start of the breeding season. This appears to be a sign of fitness, so females choose to mate with the best possible fathers of their progeny. Possible reasons why females indulge in extra-pair copulation include sourcing high quality genes, avoiding incest and increasing the genetic diversity of her brood.

[*Malurus leucopterus*, Australia.  
Photo: W. R. Taylor/Ardea]



The timing of the breeding season among Australian malurids varies with latitude and the seasonal distribution of rainfall. Fairy-wrens (*Malurus*) in the south breed in spring and early summer. Northerly species take advantage of winter precipitation to breed earlier. The **Red-backed Fairy-wren** falls into the first category, inhabiting a tropical summer-rainfall region, so its breeding activity peaks in spring and early summer. This species has, however, been recorded egg-laying in all months except June (mid-winter). The three chicks being fed by this male are an average brood size.

[*Malurus melanocephalus melanocephalus*, Goomboorian, near Gympie, SE Queensland, Australia. Photo: Cyril Webster]



For the Australian taxa, the main causes of decline are habitat loss and degradation. In the last 200 years, large areas of native vegetation in Australia have been cleared for agriculture, and much more has been subject to grazing by sheep, cattle and introduced feral goats and camels (*Camelus*). A problem for species that forage on the ground, or spend their time in the vegetation layer 1–2 m above it, is that many habitat remnants on private land have been degraded at ground level by fire and by the grazing of livestock.

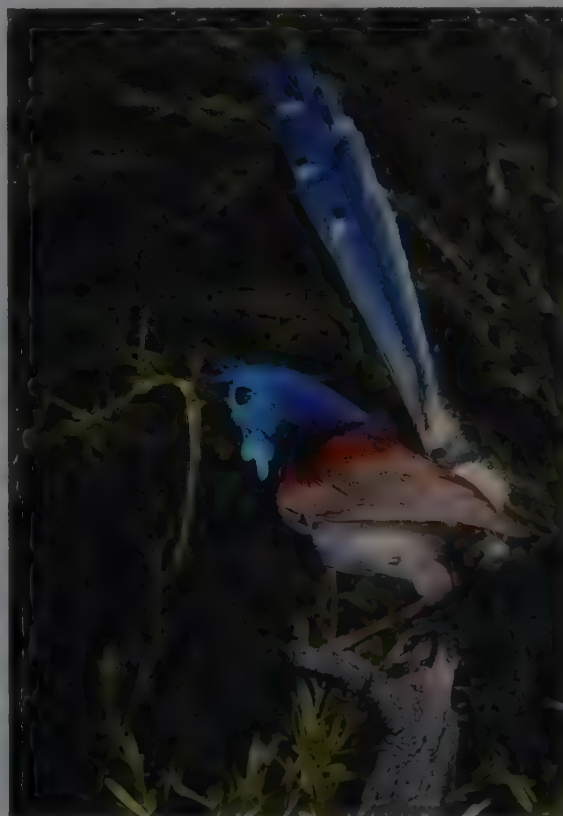
Of the 27 species in the family Maluridae, two are considered by BirdLife International and the International Union for the Conservation of Nature and Natural Resources (IUCN) to be globally threatened. These are the Mallee Emu-wren and the White-throated Grasswren, both of which are categorized as Vulnerable. A further species, the Carpentarian Grasswren, has recently been placed on the list of Near-threatened species. No species has become extinct since the time of European settlement in Australia, in 1788.

The tiny Mallee Emu-wren has suffered a considerable loss of habitat, since large areas of mallee eucalypt have been cleared and are now used for wheat-farming. Although clearance work has now ceased, the species' population has been fragmented, and the isolated subpopulations are vulnerable to extensive fires that destroy the understorey of *Triodia spinifex*, where the emu-wrens live. Although the mallee eucalypts survive fires and soon resprout, it takes three or four years or more for the spinifex understorey to regenerate to a stage that represents good emu-wren habitat. In the past, the birds could disperse from unburnt areas into regenerating burnt ones, but increased fragmentation makes it more likely that subpopulations will progressively be eliminated from even quite large patches of habitat. This has already happened in one substantial area of mallee after an extensive fire. Possible options for population recovery are the preservation and protection of the remaining habitat, appropriate management to reduce the extent and frequency of fires, and possible relocation of the species to areas from which it has been eliminated by fire. The global population of the Mallee Emu-wren in the first years of the twenty-first century is thought to number no more than some 3000 individuals. The great majority of these are based in two core areas in Victoria, one being Murray-Sunset National Park and the other Hattah-Kulkyne National Park and adjacent land. The conservation status of the species is likely soon to be upgraded to Endangered or perhaps even Critically Endangered.

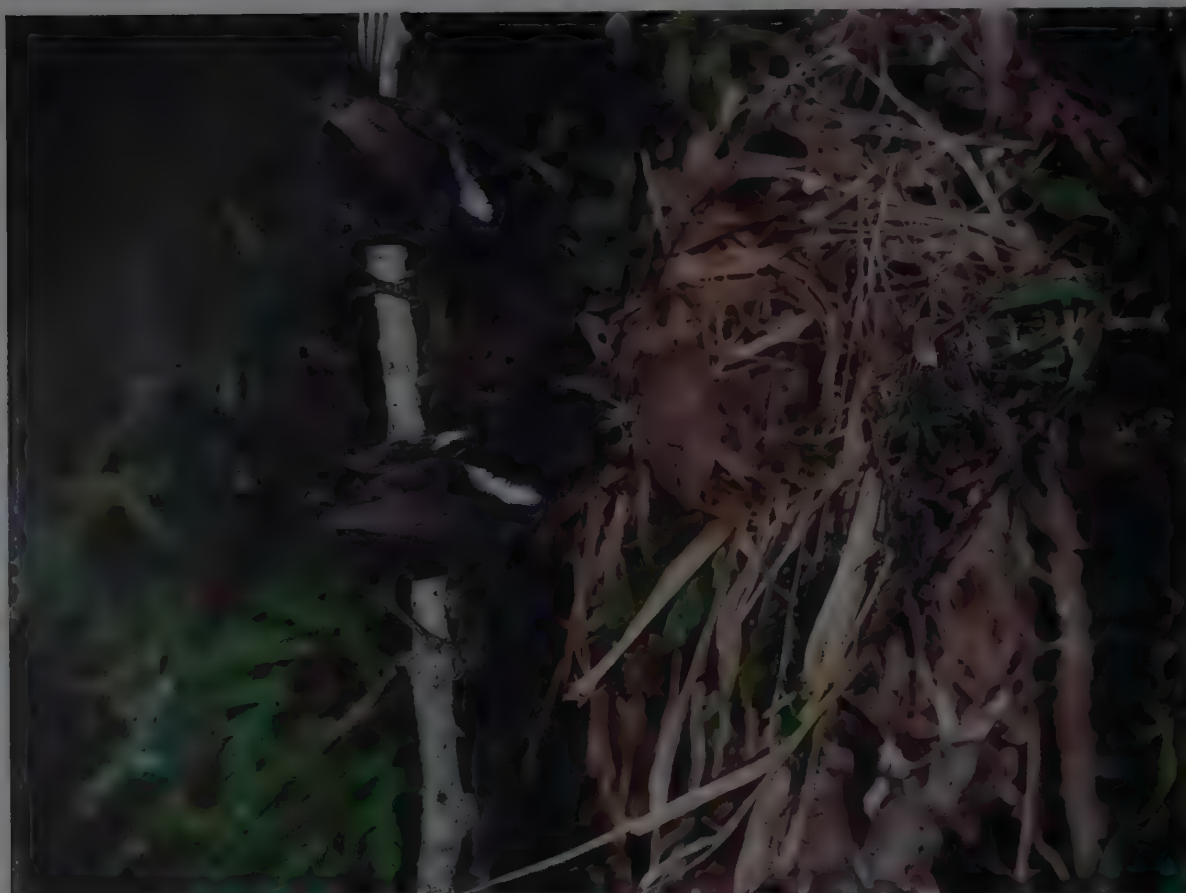
The other globally threatened malurid species, the White-throated Grasswren, is restricted to the rocky escarpment of north-west Arnhem Land, in the Northern Territory of Australia. The grasswren lives on the bare flat plateaux and rocky hillsides of this highly dissected habitat. The hillsides are covered with spinifex, the nesting habitat of the White-throated Grasswrens, and the birds prefer areas which include boulders or bare rocky pavements. The extent of their habitat is limited, and the changing frequency and timing of fire are leading to significant habitat

This "Bright"-plumaged male **Variegated Fairy-wren** is bringing a stick-insect (*Phasmida*) back to the nest. Bright males of this species are among a group of fairy-wrens with elongated, erectile ear-tufts. Males intruding into a rival's territory pump out these iridescent feathers into a "face-fan" that they use as part of a display to attract the female's attention. Males often complement this exhibition of their plumage with the striking addition of a contrastingly-coloured flower petal—yellow in the case of the Variegated Fairy-wren. Displays by intruders rarely result directly in copulation. A male displays to his own partner only occasionally.

[*Malurus lamberti lamberti*, Rockhampton, Queensland, Australia. Photo: Bert & Babs Wells/Oxford Scientific Films]







All malurids appear to live in groups, and probably all breed co-operatively. In this family, this breeding system is characterized by mature non-breeding individuals helping to raise the young of a main breeding pair; the helpers are typically offspring from a previous brood. All Australian fairy-wrens (*Malurus*) breed co-operatively, as does the **White-shouldered Fairy-wren** of New Guinea. Helpers reduce the burden on the main pair, enabling a quicker turnover between broods, and thus more broods in a season. The benefits for helpers are less clear, particularly given that regular extra-pair couplings in *Malurus* reduce the likelihood of "kin-benefit" (rearing nestlings with whom they share genes).

[*Malurus alboscapulatus moretoni*, Sogeri, SE New Guinea. Photo: Brian J. Coates]

alteration. Although the rocky nature of the area gives the birds protection from the fire itself, the greatly increased frequency of hot fires at the end of the dry season, instead of cooler fires early in the dry season, is leading to progressive replacement of spinifex by annual sorghum grass (*Sorghum*), and the gradual decline of the grasswren population is considered likely. The species occurs within the Kakadu National Park, where extensive fire management is practised. It is the population outside conservation reserves that is subject to the uncontrolled late-dry-season fires, which are a threat to habitats and wildlife across the whole of tropical northern Australia.

Within its relatively small range, in hummock grassland or low open woodland to the south of the Gulf of Carpentaria, the Carpentarian Grasswren appears to be more widespread than was hitherto thought and there is no evidence that it has declined. Nevertheless, the frequent burning of its habitat in order to produce pasture for cattle appears to eliminate the species, which prefers grassland that has remained unburnt for a long time. It is now "officially" listed as Near-threatened. Regular monitoring of Carpentarian Grasswren populations is required, as is fire management that favours the species.

None of the New Guinea members of the family is included in the IUCN list of species at risk, and all of them are insufficiently known for any realistic assessment of their status. The main threat is likely to be the large-scale clearing of lowland and foothill forests for timber and wood-chip production. Increased mining activity in New Guinea could become a threat in the future. The Orange-crowned Wren is a denizen of mountain forest, inaccessible habitat not subject to logging, and is unlikely to be seriously threatened. The widespread White-shouldered Fairy-wren has probably benefited from clearance, as it thrives in regrowth, roadside vegetation and overgrown gardens. The other three species live in lowland and foothill forest that is likely to be under threat from logging. Although Wallace's Wren and the Emperor Fairy-wren are more familiar to ornithologists than the Broad-billed Fairy-wren, which is known from fewer than 50 specimens, all three of them are dependent on forest,

and the extent of recent clearing, especially in Irian Jaya, is not well documented.

At the end of the twentieth century, a review initiated by the Australian Government Department of the Environment and Heritage (Natural Heritage Trust) was carried out by S. T. Garnett and G. M. Crowley, the results of which were published in 2000 as *The Action Plan for Australian Birds*. In addition, the Australian Environmental Protection and Biodiversity Conservation Act, referred to as the "EPBC Act", came into being in 1999. These cover only Australian species; the five species of New Guinea, comprising 15 subspecies, are not included. These two regional assessments investigated the conservation status of taxa down to the subspecies level. On this basis, one subspecies of the Maluridae is rated as "Critically Endangered", ten as "Vulnerable" and three as "Near-threatened".

Few fairy-wrens were listed in Garnett and Crowley's review. Three island subspecies are regarded as "Vulnerable", because each occurs only on a single, relatively small island. These are the Shark Bay race *bernieri* of the Variegated Fairy-wren, confined to Bernier Island, and two subspecies of the White-winged Fairy-wren, namely the nominate race on Dirk Hartog Island and, a little farther north, *edouardi* on Barrow Island; all three of these islands are off the west coast of Western Australia. In each case, there is no possibility of recolonization if the population becomes severely reduced by fire or drought. The only mainland fairy-wren included is the western, nominate race of the Purple-crowned Fairy-wren of north-west Australia, which is "Near-threatened" according to Garnett and Crowley and "Vulnerable" according to the EPBC Act. This subspecies occurs at reduced density over much of its original range and has disappeared from parts of it. It is restricted to the dense riparian vegetation of tropical rivers, and this habitat has been significantly damaged by cattle seeking access to water and, in some areas, by fire. Efforts to exclude cattle from riparian areas in order to reduce the erosion of riverbanks are of benefit to the Purple-crowned Fairy-wren.

Of all the malurids, it is the tiny emu-wrens that are most at risk. Their small size, inconspicuous plumage, weak song and



Nest hygiene and concealment are as important for malurids as they are for most passerines. Nestlings enclose their waste products in a flexible bag made of strong mucus and known as a faecal sac.

These keep the nest free of putrefying faecal matter. Adult malurids in the breeding group—here a "Bright"-plumaged male **Lovely Fairy-wren**—fastidiously remove the faecal sacs, disposing of them some distance away from the nest.

Keeping the nest area clear of conspicuous white stains reduces the risk of attracting the attention of predators. Given that each nestling can excrete one faecal sac each hour, and there may be up to four nestlings in some malurid nests, there is a considerable amount of work for the adults in collection and disposal. Other nest-related tasks are split between the breeding pair and their band of helpers, though the female takes the lion's share of the responsibilities. Among the fairy-wrens, only the female incubates. Nestlings hatch within 24 hours of each other. At first, the female busies herself with brooding, whilst the group provides food. Chick growth is rapid, and the young are well feathered when they leave the nest at 11–12 days old. The wing feathers take a further 10 days to become fully grown, during which time the fledglings hide in thick vegetation; the tail takes six weeks to reach its full length.

[*Malurus amabilis*,  
Innistail,

N Queensland, Australia.  
Photo: Hans & Judy Beste/  
Lochman Transparencies]







The major causes of nest failure among fairy-wrens are predation, and brood parasitism by cuckoos. Taking the Maluridae as a whole, perhaps 10–20% of nests fail due to parasitism. Several species of cuckoo lay their eggs in malurid nests, the most frequent being Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). In tropical Australia, the **Purple-crowned Fairy-wren** and other congeners play unwitting host and foster parent to nestlings of the Brush Cuckoo (*Cacomantis variolosus*), as in this photo.

[*Malurus coronatus coronatus*,  
Drysdale River Station,  
Western Australia,  
Australia.  
Photo: Graeme Chapman]

secretive nature render them all but invisible except to the most determined searcher. Most human beings who share the emu-wrens' habitat are quite unaware of the latter's existence. As mentioned at the start of this section, the monotypic Mallee Emu-wren is globally threatened, being placed in the category of Vulnerable. The Rufous-crowned Emu-wren is far more widespread, if patchy in distribution, and is locally common. It is not believed to be at any risk, but its near-dependence on mature *Triodia* clumps could render it vulnerable to excessive, frequent burning.

The Southern Emu-wren contains eight subspecies distributed around the coasts of the southern half of Australia and Tasmania. In South Australia, the Fleurieu Peninsula subspecies *intermedius* is "Critically Endangered" and the Eyre Peninsula race *parvirostris* is "Vulnerable"; likewise, *hartogi* of Dirk Hartog Island, in Western Australia, is rated as "Vulnerable". The area originally occupied by *intermedius* covered only about 400 km<sup>2</sup> in the Mount Lofty Ranges near Adelaide and south into the Fleurieu Peninsula. This taxon's range has been greatly reduced by habitat clearance and degradation, and it is estimated that the few remaining subpopulations now occupy no more than about 10 km<sup>2</sup>, with a remnant breeding population totalling fewer than 500 individuals. These prefer swampy land with grasses, sedges and dense low shrubby vegetation along watercourses and in gullies, but much of this swampy habitat has been drained, cleared, and grazed by stock. The few surviving patches are vulnerable to fire, and they are so isolated from each other that recolonization by dispersing individuals is no longer possible, especially since emu-wrens are so small and such weak fliers. The South Australian Department of Environment and many other conservation agencies are involved in attempts to implement a recovery plan, which involves habitat protection, revegetation, population surveys, studies of breeding biology, and a programme to increase community awareness and involvement.

Each of the two "Vulnerable" races of the Southern Emu-wren, *parvirostris* and *hartogi*, occurs in a small area of 100–200 km<sup>2</sup>, and each in a single population of a few thousand individuals. Their numbers are currently stable, but very prone to serious decline in the face of fire or drought. The habitat of *parvirostris* on the Eyre Peninsula has been fragmented by past clearance for agriculture, and the frequency of fire has increased. Although clearance work has now ceased, the remaining patches of habitat are isolated, recolonization after fire is unlikely, and the total

area in which this taxon now occurs is so small that a single extensive fire could threaten the entire population. Although the problems of this subspecies have been identified, no programme of fire management and revegetation has been specifically aimed at reducing them. The subspecies *hartogi* is found only on a long, narrow island of 420 km<sup>2</sup> off the coast of Western Australia. The island was held as a single grazing lease and, as well as sheep, it carries feral goats, house mice (*Mus musculus*) and feral cats; it is subject to occasional extensive fires. Because it lacks free water, sheep grazing has been most intensive in the southern half of the island, rendering the habitat unsuitable for emu-wrens. The



The success of malurid nests varies both between and within species, with considerable year-to-year variation as well. From a clutch of 2–5 eggs, most malurids manage to raise one or two chicks to fledgling stage. This male **Superb Fairy-wren** has gone one better, and is currently busying himself caring for three young fledglings. This is as many young as most fairy-wren groups produce from all broods in a year. At least half of all fledglings survive to become independent of their parents after one month, and, for the species studied so far, 25–40% of fledglings live beyond a year.

[*Malurus cyaneus cyaneochlamys*,  
Barrington Tops area,  
New South Wales,  
Australia.  
Photo: K. Atkinson/  
Auscape]

These two photographs depict restricted-range grasswrens (*Amytornis*) that occur at opposite ends of Australia.

In the north is the **Black Grasswren** (above), which occurs in the Kimberley region of northern Western Australia. In the south is the **Grey Grasswren** (below), which is found in Queensland, New South Wales and South Australia. Both have a global range in the region of 20,000–50,000 km<sup>2</sup> and have been evaluated as being of Least Concern.

The Black Grasswren inhabits *Triodia* hummocky grassland in sandstone escarpments, gorges and outcrops, and is restricted to the North-west Australia Endemic Bird Area. It was formerly thought to be scarce, but this was primarily due to few ornithologists having visited its remote habitat. Recent surveys reveal it to be common, and the overall population size is thought to be large. In contrast with the cases of several other malurids, occasional large fires appear to have no lasting effects on the Black Grasswren's survival.

The Grey Grasswren inhabits swampy floodplains in the arid interior, occurring in the Bulloo and Diamantina Rivers Secondary Area. Neither of these two widely separated localities is under particular threat from pastoralism, the primary land use, so the Grey Grasswren's future is probably secure.

[Above: *Amytornis housei*, Surveyors Pool, Mitchell Plateau, Western Australia, Australia.

Below: *Amytornis barbatulus barbatulus*, Bulloo Overflow, 10 km south of Adelaide Gate, New South Wales, Australia.



Photos: Graeme Chapman]





classification of *hartogi* as "Vulnerable" stems from the fact that it consists of a single, small population; although this was assessed as being stable in Garnett and Crowley's 2000 review, its continued survival will require careful monitoring and the management of grazing, fire and feral animals. The island is now under the control of the state conservation authority. The Thick-billed Grasswren has already disappeared from the island, where it was first recorded in 1916; a dedicated search in 1920, by F. L. Whitlock, failed to find the grasswren, and Whitlock attributed its disappearance to the very large feral cat population.

All five remaining races of the Southern Emu-wren are considered not to be at any risk, although all have suffered consid-

erable habitat loss in the past 200 years. These have the misfortune to share the coastal strip of south-western and south-eastern Australia with the majority of the Australian human population, and much of the low-lying coastal heath and swamp habitat has been drained and cleared for urban development. Nevertheless, because these subspecies originally had more extensive ranges than those of the races at risk, most of them still have significant areas of occurrence within conservation areas such as national parks.

The nominate, Bulloo River subspecies of the Grey Grasswren is rated as "Vulnerable". It occurs at a single location around the border between south-west Queensland and north-west New South Wales, and it could be subject to catastrophic decline through the combined effects of drought, fire, cattle grazing and the harvesting of water. Although the population, which probably fluctuates normally, is currently assessed as stable, both it and its habitat require careful monitoring.

According to the EPBC Act, all three subspecies of the Thick-billed Grasswren are "Vulnerable". The nominate, western race has suffered a considerable decrease in range. Having once occurred over the arid and semi-arid regions of south-western Australia, from the South Australian end of the Nullarbor Plain westwards to Shark Bay, and including Dirk Hartog Island, it is now found only near Shark Bay, within an area of about 1200 km<sup>2</sup>. Its disappearance from most of its former range is attributed to the combined effects of sheep and rabbits on vegetation at ground level and to 1 m above it. The taxon is quite common in the small area to which it is now restricted, especially on the Peron Peninsula, where extensive predator control is enforced over a large national park, and on some nearby sheep-grazing properties. The eastern subspecies, *modestus*, once widespread in arid and semi-arid regions from the southern Northern Territory south and east to New South Wales, is now restricted to the region of Lake Eyre, in the north-east of South Australia. The Gawler Range race *myall*, in the south part of South Australia, was never so widespread as the other two subspecies of the Thick-billed Grasswren, but it, likewise, has suffered a significant reduction in range. Again, the effects of sheep grazing and rabbits are implicated in the decline of these subspecies. As with all other taxa with restricted distributions, extensive wildfire is a major threat.

One other *Amytornis* taxon is regarded as "Near-threatened". This is the nominate race of the Striated Grasswren, which has disappeared from the southern edge of its range and declined in

**The Red-winged Fairy-wren**—here a male in "Bright" plumage, showing off his elongated, erectile ear-coverts—is classified as a restricted-range species. Occurring only in the South-west Australia Endemic Bird Area, it inhabits dense understorey vegetation, mainly in tall eucalypt (Eucalyptus) forest. The species is frequent in at least parts of its range, which is in the region of 20,000–50,000 km<sup>2</sup>. As such, while habitat fragmentation threatens the Endemic Bird Area as a whole, this species appears to be secure, and is thus evaluated as of Least Concern.

[*Malurus elegans*,  
Cheyne Beach,  
Western Australia,  
Australia.  
Photo: Chris Ross]



**The Carpentarian Grasswren** has a small range in the hilly parts of north-west Queensland and eastern Northern Territory. It is a restricted-range species, occurring only in the Gulf of Carpentaria Secondary Area. While the species is more widespread than previously thought and there is no evidence of a decline, it is nonetheless considered Near-threatened. This is because the population has become fragmented by the recently adopted practice of lighting large fires in its *Triodia* hummocky-grassland habitat to produce pasture for cattle.

[*Amytornis dorotheae*,  
20 km south of Borroloola,  
Northern Territory,  
Australia.  
Photo: Graeme Chapman]

Occurring only in north-western Arnhem Land, in Australia's Northern Territory, the **White-throated Grasswren** is listed as a restricted-range species. The population is of just 8000 birds, shared among 10 discrete subpopulations. The small remaining area of the species' spinifex (*Triodia microstachya*) habitat is severely fragmented, being destroyed by increasingly frequent fires and replaced by invasive annual sorghum grass (*Sorghum*). The combination of small population and pressing threats means the species is considered Vulnerable.

[*Amytornis woodwardi*,  
Plum Tree Creek near  
Gunlom,  
Northern Territory,  
Australia.

Photo: Graeme Chapman]



density over the rest of it. While the large extent of its range does not justify the classifying of this taxon as threatened, the processes of habitat degradation and fragmentation, fire and grazing continue. Fire is of particular significance in the spinifex grasslands of arid central Australia, and any management plan must attempt to limit the frequency and severity of fire.

Although other grasswrens, such as the Black, Dusky and Short-tailed Grasswrens, have restricted ranges, their populations and areas of distribution appear not to have diminished to such an extent that they are considered at risk. Most of these malurids live in rugged, rocky habitats where grazing by stock has not had such a significant influence.

For all malurids, whether they are considered to be at risk or not, habitat loss through land clearance is still a threat, especially in New Guinea but also in several parts of Australia. In addition, the problems of drought, fire, introduced predators, and habitat degradation caused by grazing stock are significant throughout Australia, and regular monitoring is necessary in order to ensure that population levels of bird species are maintained. The harnessing of the efforts of amateur birdwatchers made possible the large-scale surveys that have produced the two atlases of Australian birds, the first in 1984 and the second in 2003. These provide some indication of population trends, but they are not a substitute for detailed surveys of individual species perceived to be at risk.

With its distribution limited to the South-east Australia Endemic Bird Area, the **Mallee Emu-wren** is another restricted-range species. Its population is of around 3000 individuals, and the area of suitable habitat remaining is less than 2000 km<sup>2</sup>. The species has suffered considerable habitat loss, mallee eucalypt (*Eucalyptus*) having been largely cleared for wheat farming, and the hummocky *Triodia* grassland understorey taking several years to recover from fire episodes. As a result, the Mallee Emu-wren is considered Vulnerable.

[*Stipiturus mallee*,  
Hattah-Kulkyne National  
Park, Victoria, Australia.  
Photo: Tadao Shimba]



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## Subfamily MALURINAE

### Genus *SIPODOTUS* Mathews, 1928

#### 1. Wallace's Wren

##### *Sipodotus wallacii*

French: Mérion de Wallace

Spanish: Maluro de Wallace

German: Rostnacken-Staffelschwanz

Other common names: Wallace's Tree-wren/Fairy-wren/Wren-warbler, Blue-capped Wren

**Taxonomy.** *Todopsis wallacii* G. R. Gray, 1862, Vogelkop, New Guinea.

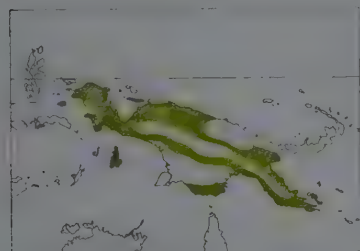
Has sometimes been placed in genus *Malurus*; originally included with *Malurus grayi* and *Malurus cyanocephalus* in a separate genus, *Todopsis*. Two subspecies recognized.

##### **Subspecies and Distribution.**

*S. w. wallacii* (G. R. Gray, 1862) – Misool, Yapen, Vogelkop and N coast of New Guinea.

*S. w. coronatus* (Gould, 1878) – Aru Is and S New Guinea.

**Descriptive notes.** c. 11–12.5 cm; 7–8 g. Male nominate race has crown and nape black with light blue feather tips; black face, white incomplete eyering, white lanceolate ear-tufts; scapulars and back rusty brown, upperwing brownish-grey, tail brownish; entire under-surface white; iris red-brown; bill long, straight and broad, bluntly pointed, black with white tip; legs short, slender, flesh-brown. Female is similar to male, except for pale yellowish wash on throat (deepest in W of range), usually duller crown. Immature is generally duller than adult, with crown speckled buff (not blue), ear-tufts and bill shorter. Race *coronatus* differs from



nominate in having undersurface washed creamy. Voice. Little known; sibilant “see see see see” contact calls emitted by foraging parties.

**Habitat.** Rainforest at 100–800 m, occasionally higher, to c. 1250 m; more in trees than in undergrowth.

**Food and Feeding.** Presumed largely insectivorous. Forages mainly 2–10 m above ground in tangles of climbers at edge of openings in forest, particularly in tangles of vines and climbing bamboos at forest edge. Occurs in groups of 4–8 individuals, which may be family parties. Frequently joins mixed-species flocks.

**Breeding.** Throughout year, with peak in Sept–Dec. Three known nests, two of which were attended each by three adults. Nest domed, with hooded side entrance near top, made of fine grasses, cobwebs and strips of palm fronds, lined with finer fibres, placed 5–10 m above ground in vines; one nest was covered on outside with bits of moss and epiphytes, and sited in shrub c. 1.5 m tall growing at top of rocky cliff face above a drop of c. 30 m. Only one clutch known, of 2 eggs; one nest contained 2 chicks, fed by both adults, 38 feeding visits in 1.5 hours. No other information.

##### **Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common in foothill rainforest. Large-scale clearing of forest represents a potential threat.

**Bibliography.** Beehler *et al.* (1986), Bell *et al.* (1979), Coates (1973, 1990), Harrison (1969a), Mack & Scholes (2003), Mayr (1986a), Rand & Gilliard (1967), Rowley & Russell (1997), Schodde (1982).

## Genus *MALURUS* Vieillot, 1816

#### 2. Broad-billed Fairy-wren

##### *Malurus grayi*

French: Mérion à bec large

Spanish: Maluro Picoancho

German: Breitschnabel-Staffelschwanz

Other common names: Broad-billed Wren-warbler; Campbell's Fairy-wren (*campbelli*)

**Taxonomy.** *Todopsis grayi* Wallace, 1862, Sorong, north-west New Guinea.

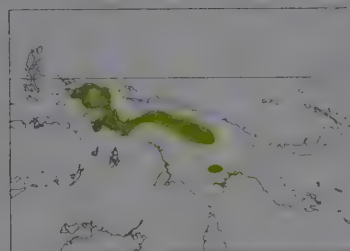
Was in the past placed in a monotypic genus *Chenorhamphus* on account of very broad bill, and has sometimes been placed with *M. cyanocephalus* and *Sipodotus wallacii* in a separate genus, *Todopsis*. Inclusion in present genus supported by plumage details and protein evidence. Isolated race *campbelli* sometimes treated as a separate species, but differs minimally from nominate. Two subspecies recognized.

##### **Subspecies and Distribution.**

*M. g. grayi* (Wallace, 1862) – NW New Guinea from Vogelkop E to Torricelli Mts, N of main cordillera.

*M. g. campbelli* Schodde & Weatherly, 1982 – Mt Bosavi (S of cordillera), in E New Guinea.

**Descriptive notes.** c. 14–14.5 cm; 14–17 g. Male nominate race has crown and forehead mottled, with blue-tipped charcoal feathers; sky-blue brow from bill to back of head, black band from lores to nape collar, long lanceolate sky-blue ear-tufts; mantle and scapulars smoky blue, grading to royal blue on lower back, upperwing and tail grey brown; below, pale sky-blue, iris dark brown; bill long, broad and flattened, black; legs brown. Female is like male except for solid charcoal-coloured crown and forehead, white belly. Immature is cinnamon-brown above, with face and malar stripe dusky, ear-tufts tawny, and with tawny breast and white belly, becomes blue first on brow, then on lower back and breast. Race *campbelli* is smaller than nominate, has crown and forehead black, and back brown. Voice. Reeling song of 2–3 seconds' duration, typical of genus.



Calls noted include a high-pitched “ssss”, from foraging parties, and a very high-pitched, sibilant slightly prolonged upslur.

**Habitat.** Understorey of tall primary forest to 1000 m; particularly favours tangled vines and shrubs under broken canopy.

**Food and Feeding.** No data on food; presumed insectivorous. Forages in groups, usually of 2–5 individuals; disturbs and snatches prey as group travels quickly through undergrowth. Does not join mixed-species flocks.

**Breeding.** Only one nest found, in Oct, containing two nestlings; fledglings observed in Feb and Nov. Nest a cavity in moss, with side

entrance, lined with dry needles and strips of bark, 0.5 m above ground on sapling. No other information.

**Movements.** Probably resident in well-separated territories.

**Status and Conservation.** Not globally threatened. Uncommon wherever found. Would appear to be subject to potential future threat from broad-scale timber-harvesting.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Diamond (1981), LeCroy & Diamond (1995), Rand & Gilliard (1967), Rowley & Russell (1997), Schodde (1982, 1984).

#### 3. Lovely Fairy-wren

##### *Malurus amabilis*

French: Mérion ravissant

German: Schmuckstaffelschwanz

Spanish: Maluro Amable

Other common names: Lovely Wren

**Taxonomy.** *Malurus amabilis* Gould, 1852, Cape York, northern Queensland, Australia.

Part of the “chestnut-shouldered group”, which includes also *M. lamberti*, *M. pulcherrimus* and *M. elegans*. Forms a superspecies with *M. lamberti*; sometimes considered conspecific, mainly on account of blue female plumage of present species and of races *dulcis* and *rogersi* of latter, but protein data support treatment as separate species. Birds from SE of range described as race *harmoni*, but considered inseparable from populations elsewhere. Monotypic.

**Distribution.** N Queensland (from N tip of Cape York Peninsula S to R Edward and, in E, to N of Townsville), in NE Australia.



**Descriptive notes.** 12–13 cm; 8–11 g. Male in Bright plumage has crown, mantle and ear-tufts azure-blue, scapulars bright rufous, lores, nape, lower back, throat and breast black; upperwing blackish; tail dusky blue with broad white tip (tail often fanned); belly white; iris brown; bill black; legs brown-black. Female has crown to lower back smoky blue, lores and orbital ring white, ear-tufts turquoise-blue, wings dark grey, tail smoky blue with broad white tip, undersurface creamy white; bare parts as male. Male in Dull plumage is variable, may resemble female or may assume grey-brown plumage. Immature resembles female, but duller.

with dusky-brown bill. Voice. Song a reel typical of genus, but relatively weak, as those of rest of “chestnut-shouldered group”. Contact call a drawn-out “treeee”, repeated; alarm a brief “zit”.

**Habitat.** Shrubby margins of rainforest and wet eucalypt (*Eucalyptus*) forest, rarely penetrating more than 50 m inside; found in vine thickets, regrowth, and shrubby understorey of eucalypt woodland. Also heathy margins of mangroves. Sea-level to c. 500 m. Replaces *M. melanocephalus* at edges of grassland.

**Food and Feeding.** Insectivorous. Forages in pairs and small groups. Exploits trees and shrubs in preference to feeding on the ground; fans tail while gleaning from branches and leaves. A strong flier.

**Breeding.** Nests found from Jul to Apr; several broods attempted in year. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, sometimes assisted by male, an oval domed structure with side entrance, of twigs, grass, rootlets and bark, with moss incorporated in roof, suspended from horizontal branch 25–40 cm above ground. Clutch 3 eggs; incubation 13–14 days; chicks fed by all members of group, leave nest at c. 14 days; independent young remain with group.

##### **Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Cape York EBA and Queensland Wet Tropics EBA. Generally uncommon; locally common in suitable habitat.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Forshaw & Muller (1978), Gould (1867), Higgins *et al.* (2001), Mack (1934a), Mathews (1912a), McCarthy (2006), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), White (1946).

#### 4. Variegated Fairy-wren

##### *Malurus lamberti*

French: Mérion de Lambert

German: Weißbauch-Staffelschwanz

Spanish: Maluro Variegado

Other common names: Lavender-flanked Wren/Fairy-wren (*dulcis*); Purple-backed Wren/Fairy-wren (*assimilis*); Rogers's Fairy-wren (*rogersi*)

**Taxonomy.** *Malurus lamberti* Vigors and Horsfield, 1827, no locality – Sydney area, New South Wales, Australia.

Part of the “chestnut-shouldered group”, which includes also *M. amabilis*, *M. pulcherrimus* and *M. elegans*. Forms a superspecies with *M. amabilis*, sometimes considered conspecific, mainly on



account of blue female plumage of latter species and of races *dulcis* and *rogersi*, but protein data support treatment of *assimilis* as a single species. Variation in colours of male and female plumage considerable, and races were at one time regarded as representing four separate species, with many additional races described. Race *assimilis* intergrades with both *dulcis* and *rogersi*, and also, in part, with coastal nominate race. Five subspecies currently recognized.

#### Subspecies and Distribution

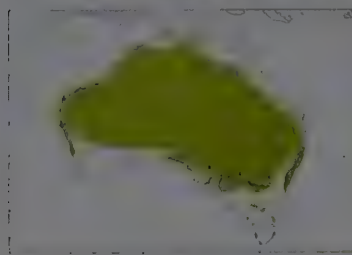
*M. l. rogersi* Mathews, 1912 – Kimberley region, in NW Australia.

*M. l. dulcis* Mathews, 1908 – Arnhem Land, in N Australia.

*M. l. bernieri* Ogilvie-Grant, 1909 – Bernier I, in Shark Bay, off W coast of Western Australia.

*M. l. assimilis* North, 1901 – mainland Australia W of Great Dividing Range.

*M. l. lamberti* Vigors & Horsfield, 1827 – Australia E of Great Dividing Range.



#### Descriptive notes

11.5–14.5 cm; 6.5–10 g. Male nominate race in Bright plumage has crown sky-blue, ear-coverts paler, separated from royal-blue mantle by black collar; scapulars rufous, lower back black; upperwing deep grey-brown, tail turquoise-grey with narrow white tips; lores, throat and breast black; belly white, becoming extensively buff-tinged on flanks and vent; iris dark brown; bill black; legs dark grey-brown. Female is greyish-brown above, including wings, with bill and lores rufous, tail turquoise-grey with narrow white tips; greyish-white below; eyes and legs as male. Male in Dull plumage is like female, but

with bill and lores black. Immature resembles female; male acquires black bill and lores at 6 months of age. Races vary mainly in plumage coloration, including that of female: *assimilis* male (Bright plumage) has crown and mantle violet-blue, ear-coverts similar or slightly paler (violet-blue to sky-blue), remiges fawn-grey, tail as nominate, lower flanks fawn-grey to pale cinnamon, generally darker than nominate but variable (becoming gradually paler from SE to W & NW); female is like nominate, brownish-grey above and greyish-cream below, with rufous lores; *bernieri* resembles W populations of previous but darker, male with deep violet-blue on crown, ear-tufts and mantle, less extensive pale cinnamon on flanks; *rogersi* has proportionately shorter tail than others, male (Bright plumage) has crown and ear-coverts deep azure-blue, mantle violet-blue, remiges and tail dark blue-grey, white tail tips broader than nominate, violet side of lower breast, female is dull steel-blue above, lores and feathers around eye chestnut; *dulcis* resembles last except for slightly less broad white tail tips, female has lores and orbital feathering white. Voice. Song a reel, but relatively weak, like that of others in "chestnut-shouldered group". Contact call a drawn-out "treeee".

**Phonetic:** "treeee" "treeee" "treeee"

**Habitat.** Dense shrubby vegetation, from coastal scrub to thickets in broken rocky country, along creeks, and throughout the arid interior.

**Food and Feeding.** Arthropods; recorded items include grasshoppers (Orthoptera), bugs (Hemiptera), beetles (Coleoptera), flies (Diptera), ants and wasps (Hymenoptera), and spiders (Araneae). Seeds also taken. Lives in pairs or small groups, which forage through shrubs and over open ground.

**Breeding.** Jul–Dec throughout range; breeds also in response to late-summer cyclonic rains; may have two or three broods a season suitable. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, an oval domed structure with side entrance, made from grass, twigs and bark, lined with fine grass, fur and feathers, placed usually low down in bush or tree, sometimes in clump of ferns or similar vegetation. Clutch 2–4 eggs; incubation by female; period 14–16 days; nestlings fed by all group-members, leave nest at 10–12 days; fledglings remain concealed for 7–10 days, fed by group for c. 1 month; young tend to remain with family group after independence.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common in suitable habitat. Widespread, occurring over c. 90% of Australia. Race *bernieri* found only on one small island, and in regional form in some states listed as "Vulnerable".

**Bibliography.** Baker (1995), Barrett *et al.* (2003), Blakers *et al.* (1984), Carnaby (1954), Ford & Johnstone (1991), Harrison (1972), Higgins *et al.* (2001), Mack (1934a), Murchant (1992), Mathews (1913), McCarthy (2006), Robinson (1955), Rowley (1991), Rowley & Russell (1997), Schodde (1975, 1982), Schodde & Mason (1999), Tibbets & Pruett-Jones (1999), Tidemann (1983, 2004), Tuttle & Pruett-Jones (2004).

## 5. Blue-breasted Fairy-wren

### *Malurus pulcherrimus*

**French:** Mérion à gorge bleue

**German:** Blaubrust-Staffelschwanz

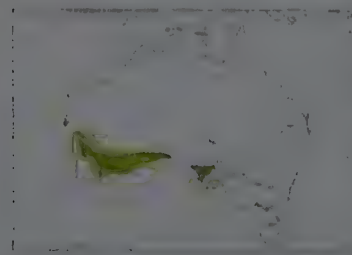
**Spanish:** Maitro Pechazul

**Other common names:** Blue-breasted Wren

**Taxonomy.** *Malurus pulcherrimus* Gould, 1844, Western Australia – Wongan Hills, south Western Australia.

Part of the "chestnut-shouldered group", which includes also *M. amabilis*, *M. lamberti* and *M. pulcherrimus*, and are that it is closest to last-named, was once confused with race *assimilis* of *M. lamberti* and then considered closely allied with that species. Monotypic.

**Distribution.** SW & S Australia, in diagonal belt from S Western Australia to extreme SW South Australia and, disjunctly, Eyre Peninsula.



**Descriptive notes.** 13.5–15 cm; 9–10 g. Male in Bright plumage has crown, upper back and ear-tufts violet-cobalt, lores, nape, collar and lower back black, narrow blue orbital ring; scapulars rufous, upperwing deep grey-brown, tail dull blue with narrow white tip; throat and breast dark indigo, belly greyish-white; iris dark brown; bill black; legs grey-brown. Female is grey-brown above, with rufous lores and feathers around eye, creamy white below; bare parts as male, except that bill is dark brown. Male in Dull plumage is like female, but retains black bill and lores, and has trace of blue on face and around eye. Immature resembles female; male shows black in lores at 3 months of age. Voice. Song a rather quiet reel, like that

of others in "chestnut-shouldered group". Contact call a short high-pitched "see"; alarm a weak "tsit", also a churring rattle.

**Habitat.** Tall sand-plain heath and eucalypt woodland (*Eucalyptus wandoo*) with adequate understorey.

**Food and Feeding.** Insectivorous; eats beetles (Coleoptera), including weevils (Curculionidae), also flies (Diptera), ants and wasps (Hymenoptera), and caterpillars. Lives in groups of 2–4 adults, often with some younger individuals; group territory c. 2.5 ha. Forages on the ground in winter months, and in low shrubs through spring and summer; reluctant to fly.

**Breeding.** Aug–Jan; female lays 1–4 clutches per year, renests after failure, may raise two broods. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, an oval domed structure with side entrance, made from grass, leaves and small twigs, lined with fine grass, plant down, feathers and fur, placed generally low down (average c. 59 cm above ground) in shrub, tree, dense tangle or accumulated litter; later nests sited higher up than early ones. Clutch 2–3 eggs; incubation by female, period 14–15 days; nestlings fed by all group-members, leave nest at 10–12 days; fledglings remain hidden for a week, then travel with foraging group, fed by parents and helpers for c. 1 month; young remain with family group after independence, may attend later nestlings by parents. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Resident. Disperses in random directions; females travel farther.

**Status and Conservation.** Not globally threatened. Locally fairly common; appears able to survive widespread clearance of habitat for wheat-growing if sufficient patches of suitable vegetation remain. Current breeding productivity little above replacement levels, and may worsen if climate becomes drier.

**Bibliography.** Ashby (1924), Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker, L.C. & Brooker (2002, 2003), Brooker, M.G. & Brooker (2001), Ford (1966, 1969), Higgins *et al.* (2001), Mack (1934a), Mathews (1913), Mayr & Serventy (1944), McCarthy (2006), Mellor (1921), Milligan (1903), Rowley (1981a, 1991), Rowley & Russell (1997, 1998, 2002), Schodde (1982), Schodde & Mason (1999), Serventy (1951).

## 6. Red-winged Fairy-wren

### *Malurus elegans*

**French:** Mérion élégant

**German:** Silberkopf-Staffelschwanz

**Spanish:** Maluro Elegante

**Other common names:** Red-winged Wren

**Taxonomy.** *Malurus elegans* Gould, 1837, Swan River, south-west Australia.

Part of the "chestnut-shouldered group", which includes also *M. amabilis*, *M. lamberti* and *M. pulcherrimus*. Protein data indicate that present species is most closely allied to last of these. Monotypic.

**Distribution.** Forested SW corner of Australia.



**Descriptive notes.** 14–15.5 cm; 8.5–11.5 g. Male in Bright plumage has crown, upper back and ear-coverts iridescent sky-blue, narrow blue ring around eye; lores, nape and lower back black; scapulars distinctive, bright rufous; upperwing deep grey-brown, tail dusky blue with narrow white tip; throat and breast navy-blue, belly greyish-white; iris dark brown; bill black; legs dark grey-brown. Female is grey-brown above, scapulars suffused with rufous, lores deep rufous, eyering pale grey, tail as male; chin and breast white, belly grey-buff; bare parts as male, including black bill. Male in Dull plumage is as female but retains black lores,

and often traces of blue in plumage. Immature resembles female; male shows black in lores from 6 weeks of age. Voice. Song a reel typical of genus, with 3–4 introductory notes more prolonged than in other species. Group-members maintain contact with "see-see-see"; alarm a sharp "tsit".

**Habitat.** Dense understorey vegetation mainly in tall eucalypt (*Eucalyptus*) forest; also wet coastal heath and similar dense growth. Replaced by *M. pulcherrimus* where *Eucalyptus marginata* forest gives way to *E. wandoo*.

**Food and Feeding.** Insects, especially ants (Formicidae) and beetles (Coleoptera); also some spiders (Araneae). Lives in groups of 2–9 individuals, which forage on or near the ground. Techniques include hop-search and pounce in litter and dead brush; also gleans in low shrubs, bracken (*Pteridium*) and understorey trees. Weak flier.

**Breeding.** Season short, Oct–Dec. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, an oval domed structure with entrance at side, made of grass, leaves and small twigs, lined with fine grass and plant down, placed close to ground in dead bracken or dead brush. Clutch 2–3 eggs; incubation by female, period 14–15 days; chicks fed by all members of group, nestling period 11–12 days; fledglings remain hidden for a week, then travel with foraging group, fed by parents and helpers for c. 1 month; young remain with family group for at least 1 year.

**Movements.** Resident. Dispersal mainly by females more than 1 year old; both sexes rarely disperse farther than 1–2 territories from natal one.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in South-west Australia IBA. Generally considered to be reasonably common. Long-lived, and able to survive fires.

**Bibliography.** Baker (1995), Barrett *et al.* (2003), Blakers *et al.* (1984), Gould (1865), Higgins *et al.* (2001), Mathews (1916), McCarthy (2006), Payne *et al.* (1991), Rowley (1991), Rowley & Russell (1997), Rowley *et al.* (1988), Russell & Rowley (1998, 2000), Russell *et al.* (1991), Schodde (1982), Schodde & Mason (1999), Woolfer & Calver (1981).

## 7. Superb Fairy-wren

### *Malurus cyaneus*

**French:** Mérion superbe

**German:** Prachstaffelschwanz

**Spanish:** Maitro Soberbio

**Other common names:** Blue Wren Fairy-wren, Superb Blue Wren

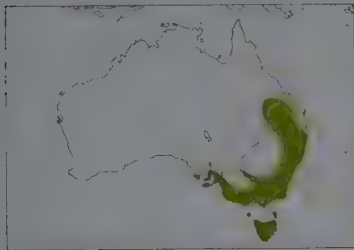
**Taxonomy.** *Motacilla cyanea* Ellis, 1782, Tasmania, Australia.

Forms a superspecies with *M. splendens*; these two, together with *M. coronatus*, constitute the "Australian blue group". Six subspecies recognized.



**Subspecies and Distribution.**

*M. c. leggei* Mathews, 1912 – extreme S & SE South Australia.  
*M. c. ashbyi* Mathews, 1912 – Kangaroo I, off South Australia.  
*M. c. cyanochlamys* Sharpe, 1881 – E & SE Australia from SE Queensland S to Victoria.  
*M. c. elizabethae* A. J. Campbell, 1901 – King I, in W Bass Strait.  
*M. c. samueli* Mathews, 1912 – Flinders I, in E Bass Strait.  
*M. c. cyaneus* (Ellis, 1782) – Tasmania.



**Descriptive notes.** 15–20 cm; 9–14 g. Male nominate race in Bright plumage has crown, ear-tufts and back iridescent cerise-blue, eyestripe, collar, scapulars and uppertail-coverts black; upperwing dark grey-brown, sometimes with faint blue suffusion, tail dusky blue; chin to breast blue-black, usually a faint pale blue narrow band immediately below breast, belly white; iris blackish-brown; bill black; legs dark brown. Female has lores and circumorbital feathers rufous, crown, back and wings rather dark grey-brown, tail greenish-brown, chin to belly greyish-white, becoming greyer on flanks; iris blackish-brown, bill orange-brown.

legs brown. Male in Dull plumage is similar to female but retains black bill and lores, has darker tail. Immature resembles female once tail full grown; male develops darker lores and bill during first winter. Races vary mainly in size and in intensity of blue of male Bright plumage, island forms larger and darker blue: *samueli* is largest, male like nominate or slightly darker, female with less extensive rufous around eye; *elizabethae* is close to previous in size, male rather deep blue, has wings dark grey with usually strong dark blue wash, extensive blue wash across lower breast and upper belly, female as nominate; *cyanochlamys* is small, male paler blue than nominate (grading to palest in N of range), wings with little or no blue cast (but often faintly rufous-tinged), female grey-brown with rufous wash above, little blue suffusion in plumage, restricted rufous around eye, whiter below than nominate; *leggei* resembles previous in size and in male coloration, but female is much greyer above, with much bluer tail, male in Dull plumage is slightly greyer; *ashbyi* is medium-sized, male similar to last but without rufous tinge on wings, female rather dark grey above with somewhat more extensive rufous around eye, deep blue-grey tail, pale grey on breast grading to medium grey on flanks. Voice. Characteristic malurid reel, given by both sexes throughout day, appears to advertise territorial ownership; variant of reel, with a series of a different syllable type inserted at beginning, is usually triggered by presence of potential predator. Contact maintained with brief “chet” calls; alarm a brief “chit”; incubating female “purs”.

**Habitat.** Originally inhabited open eucalypt (*Eucalyptus*) forest, but this habitat now largely cleared for agriculture. Has adapted to exotic shrubs/weeds such as lantana (*Lantana*), rose (*Rosa*) and bramble (*Rubus*), and to larger suburban parks and gardens. Mainly in region where annual rainfall exceeds 400 mm. In a recent study, birds of Kangaroo I race *ashbyi* found to occupy a somewhat broader niche than nearby mainland birds.

**Food and Feeding.** Chiefly insects, mainly grasshoppers (Orthoptera), shield-bugs (Pentatomidae), ants (Formicidae), flies (Diptera), weevils (Curculionidae) and their larvae; also other arthropods, e.g. spiders (Araneae). Also eats small seeds and fruits, such as those of the chenopodiaceous genus *Rhagodia*. Food items gathered by pouncing as it hops over open ground or forages under shrubs. Lives in groups of 2–5 adults.

**Breeding.** Jul–Feb; lays up to four clutches in a season and may rear more than one brood. Socially monogamous, remaining paired throughout year, but sexually promiscuous; female seeks extra-group matings but returns to nest in group territory (in studies, 76% of young fathered by male/males from outside group). Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, an oval domed structure of grass and rootlets, lined with fur and feathers, placed low down in dense cover. Clutch 2–4 eggs, usually 3, laid at daily intervals; incubation by female, period 14 days; chicks fed by all members of group, nestling period 10–14 days; fledglings fed by all group-members, independent at c. 40 days of age; young stay with parents, may help to feed young of later brood, young males usually remain in natal group as helpers for at least a year, young females more likely to disperse. Nests parasitized by Horsfield’s Bronze-cuckoo (*Chrysococcyx basalus*). Male sexually mature at 1 year.

**Movements.** Resident. Dispersal largely by females; males tend to be philopatric.

**Status and Conservation.** Not globally threatened. Locally common. Able to cope with exotic predators, e.g. domestic cats, and competitors, e.g. sparrows (*Passer*), and to thrive in suburban parks and gardens if sufficient cover available.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Bradley & Bradley (1958), Christidis & Schodde (1991a, 1997), Cockburn *et al.* (2003), Cooney & Cockburn (1995), Double & Cockburn (2000, 2003), Dunn & Cockburn (1996, 1999), Green, Cockburn *et al.* (1995), Green, Osmond *et al.* (2000), Higgins *et al.* (2001), Langmore & Mulder (1992), Langmore *et al.* (2003), Lill *et al.* (2006), Macgregor & Cockburn (2002), McCarthy (2006), Mulder (1995, 1997), Mulder & Cockburn (1993), Mulder & Langmore (1993), Mulder & Magrath (1994), Mulder *et al.* (1994), Peters (2000), Peters, Aspinner, Ebdon & Cockburn (2000), Peters, Aspinner & Cockburn (2002), Rowley (1957, 1965), Rowley & Russell (1997), Schlotfeldt & Kleindorfer (2006), Schodde (1982), Schodde & Mason (1999), Tidemann (2004).

## 8. Splendid Fairy-wren

### *Malurus splendens*

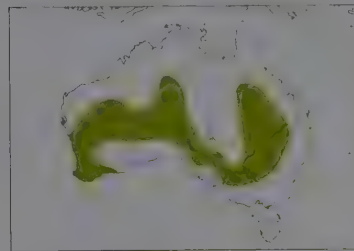
**French:** Mérion splendide **German:** Türkisstaffelschwanz **Spanish:** Maluro Espléndido  
**Other common names:** Banded Superb Warbler, Splendid Wren; Turquoise Fairy-wren (*musgravi*); Black-backed Fairy-wren (*melanotus*)

**Taxonomy.** *Saxicola splendens* Quoy and Gaimard, 1830, King George Sound, south-west Australia. Forms a superspecies with *M. cyaneus*; these two, together with *M. coronatus*, constitute the “Australian blue group”. Races originally treated as constituting three separate species, but interbreed wherever they meet. Birds from C Australia long referred to as race *cultanius*, but type specimen for that name is apparently an intergrade, and therefore taxonomically unidentifiable, name replaced by *musgravi*. As many as seven subspecies described from early collections, but later studies have shown that most represent clinal variation, e.g. *whiter* (described from interior New South Wales) is regarded as representative part of clinal variation of *melanotus*, and *aratus* (interior of Western Australia) is now included within nominate. Four subspecies recognized.

**Subspecies and Distribution.**

*M. c. splendens* (Quoy & Gaimard, 1830) – subtropical W & WC Australia  
*M. c. musgravi* Mathews, 1922 – C Australia from C & SW Northern Territory S to South Australia (E to Flinders Ranges).

*M. s. emmottorum* Schodde & Mason, 1999 – C Queensland (Cooper–Diamantina Divide, Opalton).  
*M. s. melanotus* Gould, 1841 – S Queensland, inland New South Wales, extreme NW Victoria and SE South Australia (E from Flinders Ranges).



**Descriptive notes.** 11.5–13.5 cm; 8–11 g. Male nominate race in Bright plumage has crown, back, scapulars, throat and most of ventral surface rich violet-blue, ear-tufts sky-blue, black lores and stripe through eye to black hindcollar; tail cobalt-blue; primaries edged turquoise; black pectoral band 3–5 mm deep; iris dark brown; bill black, legs slaty-brown to black. Female has crown, back and wings grey-brown, lores and feathers around eye rufous, tail distinctively dark bluish-turquoise, throat and underparts whitish; eyes dark brown, bill orange-brown, legs pinkish-brown to dark brownish-grey. Male in Dull plumage is like

female, but has tail cobalt-blue, primaries edged turquoise, bill and legs black. Immature resembles female; in first winter, male acquires turquoise primaries and bill, and lores darken. Races differ mainly in darkness of blue and depth of pectoral band of Bright-plumaged male: *musgravi* is paler than nominate, has light sky-blue crown and mantle with broad black band over lower back, pale sky-blue ear-tufts, deep violet-blue throat, black breastband 3–6 mm deep; *melanotus* differs from previous in having blue areas mid-blue, with violet cast on crown, mantle and throat, black pectoral band 1–3 mm deep, white mid-belly; *emmottorum* is smaller and shorter-tailed than others. Bright male has throat pale sky-blue, black breastband 2–4 mm deep, white mid-belly. Voice. Song a reel typical of genus, with a series of loud trills introduced by softer, simpler elements, reel louder and harsher than those of “chestnut-shouldered group” and “bicolorated group”; variant, given in presence of potential predator, includes a string of notes of a different type added at end of reel. Contact call a single, soft “trrrt”; alarm a sharp “tsit”; also a churring threat directed at intruders, including cuckoos (Cuculidae).

**Habitat.** Shrubland and other dense vegetation, varying from eucalypt (*Eucalyptus*) woodland/heath in SW of range to mulga-mallee in C & E semi-arid and arid areas. Nominat race in SW of range is replaced by *M. elegans* in forest and by *M. pulcherrimus* in heathland.

**Food and Feeding.** Primarily insects, mainly ants (Formicidae), small beetles (Coleoptera), grasshoppers and crickets (Orthoptera), and bugs (Hemiptera); also some other arthropods, e.g. spiders (Araneae) and centipedes (Chilopoda). Some plant material taken occasionally. Insects gathered by hop and search, with occasional “tower flight” in pursuit of swarming termites (Isoptera); sometimes forages for insects in canopy of flowering eucalypts. Lives in groups of 2–8 adults.

**Breeding.** Aug–Jan; lays up to four clutches in a season and may rear more than one brood. Socially monogamous, remaining paired throughout year, but sexually promiscuous; female seeks extra-group matings but returns to nest in group territory (in studies, more than 66% of young in a brood fathered by male/males from outside group). Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, an oval domed structure with side entrance near top, made of grass, lined with fur and feathers, placed 30–250 cm above ground in shrub. Clutch 2–4 eggs, usually 3, laid at daily intervals; incubation by female, period normally 14–15 days (12–17); chicks fed by all members of group, nestling period 10–13 days; fledglings fed by all group-members, remain concealed for a week, independent at c. 40 days; young stay with parents, may help feed young of later brood, males usually stay in natal group as helpers for at least a year, females more likely to disperse. Nests parasitized by Horsfield’s Bronze-cuckoo (*Chrysococcyx basalus*). Male sexually mature at 1 year.

**Movements.** Resident. Tendency for more females than males to disperse.

**Status and Conservation.** Not globally threatened. Locally common throughout its range. Unlike *M. cyaneus*, does not persist in city parks and gardens.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker, L.C. & Brooker (1995), Brooker, M.G. & Brooker (1995), Brooker, M.G. & Rowley (1995), Brooker, M.G., Rowley *et al.* (1990), Christidis & Schodde (1991a, 1997), Gould (1833, 1867), Higgins *et al.* (2001), Mack (1934a), McCarthy (2006), Mees (2003), Rowley (1981b, 1991), Rowley & Brooker (1987), Rowley & Russell (1990, 1997), Rowley, Brooker & Russell (1991), Rowley, Russell *et al.* (1989), Russell & Rowley (1988, 1993a, 1993b, 1996), Schodde (1982), Schodde & Mason (1999), Tarvin *et al.* (2005), Tibbitts & Pruett-Jones (1999), Tidemann (2004), Tuttle & Pruett-Jones (2004), Van Bael & Pruett-Jones (2000), Webster *et al.* (2004), Zelano *et al.* (2001).

## 9. Purple-crowned Fairy-wren

### *Malurus coronatus*

**French:** Mérion couronné **German:** Purpurkopf-Staffelschwanz **Spanish:** Maluro Coronado  
**Other common names:** Lilac-crowned Wren/Fairy-wren; MacGillivray’s Fairy-wren (*macgillivrayi*)

**Taxonomy.** *Malurus coronatus* Gould, 1858, near mouth of Victoria River, Northern Territory, Australia.

Was for long placed in a monotypic genus, *Rosina*; protein evidence, however, allies it with *M. cyaneus* and *M. splendens*, the three constituting the “Australian blue group”. Race *macgillivrayi* sometimes considered a separate species. Two subspecies recognized.

**Subspecies and Distribution.**

*M. c. coronatus* Gould, 1858 – rivers of Kimberley region and adjacent W Northern Territory, in NW Australia.

*M. c. macgillivrayi* Mathews, 1913 – rivers bordering S Gulf of Carpentaria (E Northern Territory and W Queensland), in N Australia.



**Descriptive notes.** 14–15.5 cm; 9–12 g. Male nominate race in Bright plumage has crown purple-mauve with central black oblong; lores and broad band back through eye and ear-coverts and across nape black (lacks elongated ear-tufts); upperparts sandy brown, underwing grey-brown, scapulars and upperwing-coverts cinnamon-brown; tail deep blue, tipped white; throat and underparts white, washed buff on side and lower underparts, iris blackish-brown, bill black; legs dark brown. Female differs from male in having crown mid-grey, ear-coverts rich chestnut, eyebrow and periorbital ring white, tail greenish-blue. Male in Dull plumage is as female except for face, which is faded black and grey. Immature resembles female, but



crown brown and tail longer than adult's; male develops black on face at 6–9 months of age. Race *parvulus* is smaller than nominate, has back grey, tail greenish-olive, belly white. Voice: songs 2 types, first, louder, slower and lower in pitch than that of congeners, repeated elements clearly heard. Group-members maintain contact with "chet", singly or repeated; alarm call a sharp "zit" or an excited series.

**Habitat.** Dense tropical vegetation, typically with tall grasses or prickly pines (*Pachira*), beside water, rarely more than 10 m from a river or spring.

**Food and Feeding.** Mainly invertebrates gathered in dense foliage, including especially beetles (Coleoptera), ants (Formicidae), grasshoppers (Orthoptera), bugs (Hemiptera), spiders (Araneae) and worms (Oligochaeta). Large, strong feet enable this species to grasp *Pandanus* leaves in order to forage among litter in leaf axils. Lives in groups of 2–7 individuals, which defend linear territory of 200–300 m along riverbank.

**Breeding.** Two peaks, one in Apr and other in Aug; may rear more than one brood when conditions favourable. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Nest built by female, a bulky, oval, domed structure of rootlets, grass and leaves, often placed in leaf axils of *Pandanus aquaticus* 25–290 cm above ground; new nest built after failure.

Clutch 2–3 eggs, laid on successive days; incubation period c. 14 days; chicks fed by all members of group, leave nest at c. 10 days; fledglings fed by all group-members, remain concealed for a week, then travel with foraging group, continue to be fed for c. 1 month; juveniles tend to stay in natal group after reaching independence; young of both sexes may spend at least one season as helper.

**Movements.** Resident. Females disperse more often, and farther, than do males.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. In regional conservation assessments, nominate race rated "Vulnerable" because of its extreme preference for riverside vegetation which is subject to overgrazing, frequent burning and erosion; distribution severely reduced since human settlement; population estimated at 12,000 individuals. *l. race maculifrons* less affected by human colonization; healthy populations on most rivers in range. Preservation of riverside vegetation is crucial; this requires a reduction in damage caused by cattle, by weed invasion and by fire. Occurs in several national parks in Western Australia, Northern Territory and Queensland.

**Bibliography.** Aumann (1991), Barrett *et al.* (2003), Blakers *et al.* (1984), Boeckel (1979), Christidis & Schodde (1997), Garnett & Crowley (2000), Higgins *et al.* (2001), Mathews (1912b), Rowley (1988, 1993), Rowley & Russell (1993, 1997), Schodde (1982), Schodde & Mason (1999).







PLATE 42

inches 3  
cm 8

## 10. Red-backed Fairy-wren

### *Malurus melanocephalus*

**French:** Mérion à dos rouge **German:** Rotrücken-Staffelschwanz **Spanish:** Maluro Dorsirrojo  
**Other common names:** Black-headed Fairy-wren, Blood/Elfín/Orange-backed Wren, Red/Red-backed Wren, Blood-backed Wren-warbler, Scarlet-backed Warbler, Orange-backed Flycatcher

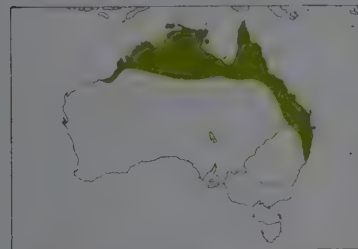
**Taxonomy.** *Muscicapa melanocephala* Latham, 1801, New Holland = near Sydney, New South Wales, Australia.

Protein evidence indicates that closest allies are *M. leucopterus* and *M. alboscapulatus*; the three constitute the "bicoloured group". Races intergrade in NE Queensland, where hybridization zone between R Endeavour and R Burdekin. Two subspecies recognized.

#### Subspecies and Distribution.

*M. m. cruentatus* Gould, 1840 – N Western Australia (from Cape Keraudren) E, N of 20° S, to N Queensland (S to base of Cape York Peninsula and Charters Towers).

*M. m. melanocephalus* (Latham, 1801) – NE Queensland (E Cape York Peninsula) S along coast to E New South Wales.



**Descriptive notes.** 10–12.5 cm; 6–8 g. Male nominate race in Bright plumage is satiny black except for dusky-brown primaries and fiery orange scapulars, back and rump; iris dark brown; bill black; legs brown. Female has lores and eyering pale buff, crown and upperparts warm mid-brown, wing and tail dark grey-brown, whitish below, becoming ochre-washed or buff on side and lower underparts; bill pinkish-brown, legs light brown. Male in Dull plumage is as female, but bill darker. Immature resembles female once tail grown. Race *cruentatus* is smaller and shorter-tailed than nominate, and has scapulars, back and rump

scarlet to crimson. **VOICE.** Soft reel with weak introductory notes. Contact call a quiet "ssst"; alarm a shrill "zit".

**Habitat.** Wide variety of vegetation, especially with tall grassy ground cover and sparse tree cover, mostly in tropical and subtropical summer-rainfall regions. Replaced by *M. amabilis* at edges of grassland.

**Food and Feeding.** Mainly insects, e.g. ants (Formicidae), cockroaches (Blattodea), beetles (Coleoptera), grasshoppers (Orthoptera), caterpillars; also some spiders (Araneae). Seeds also recorded in diet. Foraging methods include "hop-search" in litter on the ground, and rapid "flutter-chase" through substrate in order to disturb prey, which it then pursues. Gleans items from leaves and stems of grasses and shrubs. Outside breeding season, sometimes forms foraging flocks of up to 30 individuals.

**Breeding.** Egg-laying recorded in all months except Jun, but mostly in wet season. Socially monogamous but sexually promiscuous; remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years. Territorial in breeding season. Nest built by female, an oval domed structure with side entrance, of grass and strips of bark, lined with fine grass, rootlets, plant down, fur and feathers, usually less than 1 m above ground and well concealed in tussock of grass or small shrub. Clutch 2–5 eggs; incubation by female, period 12–13 days; chicks fed by all members of group, nestling period 11–12 days; fledglings led away by parents, remain hidden for a week, fed by all group-members, then join foraging group, continue to be fed for c. 1 month, thereafter remain with family and may help at a second nesting attempt. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Brush Cuckoo (*Cacomantis variolosus*).

**Movements.** Sedentary; tends to wander locally outside breeding season.

**Status and Conservation.** Not globally threatened. Common throughout its current range. Appears to have withdrawn from areas of large-scale human settlement with less suitable tall grassland available; e.g. no longer present in Port Jackson (= Sydney), from where type specimen collected. Elsewhere, clearing of woodland and increase in cultivation have possibly extended the area of habitat suitable for this malurid.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Cooper (1969a), Higgins *et al.* (2001), Hughes & Hughes (1988), Karubian (2002), Karubian & Alvarado (2003), Mack (1934a), Mathews (1913), McAllan (2002), McCarthy (2006), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Swaddle *et al.* (2000).

## 11. White-winged Fairy-wren

### *Malurus leucopterus*

**French:** Mérion leucoptère **German:** Weißflügel-Staffelschwanz **Spanish:** Maluro Aliblanco  
**Other common names:** White-winged Superb Warbler, Black-and-white Wren; Blue-and-white Wren/Fairy-wren (*leuconotus*); White-backed Wren/Fairy-wren (aberrant white-backed forms)

**Taxonomy.** *Malurus leucopterus* Dumont de Sainte Croix, 1824, Dirk Hartog Island, Western Australia.

Protein evidence indicates that closest allies are *M. melanocephalus* and *M. alboscapulatus*; the three constitute the "bicoloured group". DNA evidence suggests that the two black-and-white island forms, i.e. nominate race and *edouardi*, are not each other's closest relative; further study required. Possible genetic variation within race *leuconotus* requires further investigation. Three subspecies recognized.

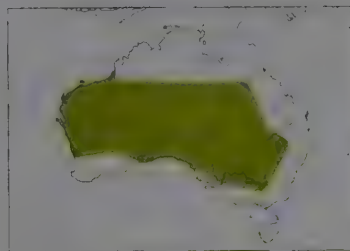
#### Subspecies and Distribution.

*M. l. edouardi* A. J. Campbell, 1901 – Barrow I., in Western Australia.

*M. l. leucopterus* Dumont de Sainte Croix, 1824 – Dirk Hartog I., in Western Australia.

*M. l. leuconotus* Gould, 1865 – coast of Western Australia E across most of mainland (except N) to E & S Queensland, E New South Wales and NW Victoria.

**Descriptive notes.** 11–13.5 cm; 6–8 g. Male nominate race in Bright plumage is glossy black all over, except for white scapulars, secondary wing coverts and innermost secondaries (large white "shoulder patch"), blue-edged grey-brown primaries and dark blue tail; thighs often brown-tinged; iris dark brown; bill black; legs dark grey-brown. Female has drab grey-brown crown, back and



wings, grey tail faintly washed blue, whitish below, flanks and lower underparts washed dull buff; bill pinkish-brown, eyes and legs as male. Male in Dull plumage resembles female, but has darker bill. Immature is like female; male does not attain full Bright plumage until fourth year. Race *edouardi* is on average slightly smaller than others, male plumage as nominate, female somewhat browner than nominate; *leuconotus* male has black areas of plumage replaced by cobalt-blue, tail slightly less dark than in other races, occasional aberrant individuals (including type specimen) have much white in upperparts. **VOICE.** Song a few short

introductory notes followed by prolonged reel of up to 4 seconds' duration with regular rise and fall in pitch. Contact calls "tsit" or a brief soft reel; alarm and abrupt "zit".

**Habitat.** Low shrubland throughout arid and semi-arid areas, especially in samphire on salt pans and chenopod shrublands. Replaced by *M. lamheri* or *M. splendens* where vegetation is taller, and by *M. melanocephalus* N of 20° S.

**Food and Feeding.** Insects, especially beetles (Coleoptera); also spiders (Araneae). Also eats some seeds of plant genera *Rhagodia*, *Chenopodium*, *Euphorbia* and *Portulaca*. Small size allows this species to glean from leaves and stems of dense shrubs; also hop-searches on the ground, and makes brief aerial sorties to catch insects. Lives in pairs and in groups.

**Breeding.** Reported in all months except Jun, mainly in spring and summer but also after good rains in autumn, females renege after failure; in studies, 20% of females reared two broods in a year. Socially monogamous but sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years; complex social relationships; appears to live in groups containing several breeding females, each with male partner in brown Dull plumage, and single Bright male in full blue plumage; territory area defended by dominant Bright male and rest of group includes nesting areas of all breeding females in group; blue male has his own female partner, and she and other females may also have non-breeding helpers, generally brown males; full-plumaged males in individual "clan" area relatively rare, and outnumbered by plain, sexually mature males paired with breeding females in same "clan" area. Nest built by female, a domed structure measuring 10 × 6 cm (smallest malurid nest), with side entrance, made from fine grasses, lined with plant down and feathers, usually less than 1 m above ground (mean 24 cm) in middle of dense, often thorny bush. Clutch 2–4 eggs (largest clutch size in family); incubation by female, period 13–14 days; chicks fed by all members of group, nestling period 10–11 days; fledglings remain concealed for a week, fed by all group-members for c. 4 weeks, young remain in family group, may help to raise later broods. Nest parasitism by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) recorded.

**Movements.** Resident. May be locally nomadic outside breeding season.

**Status and Conservation.** Not globally threatened. Common in much of its extensive range. In regional assessments of conservation status of taxa, mainland race *leuconotus* is considered secure, but the two island races, nominate and *edouardi*, are considered "Vulnerable", having small populations. Strict adherence to current management practices and the exclusion of exotic predators are required if the island races are to survive.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Boehm (1957), Boles & Dingley (1977), Brooker & Brooker (1989), Carter (1917), Doucet *et al.* (2004), Driskell *et al.* (2002), Higgins *et al.* (2001), Kinghorn & Iredale (1924), Mack (1934a), Mathews (1912a, 1913, 1930b), McCarthy (2006), Parker (1975), Pruett-Jones & Tarvin (2001), Rathburn & Montgomerie (2003, 2004), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Tidemann (1980, 1983, 1989), Tidemann & Marples (1987), Tuttle & Pruett-Jones (2004), Whitlock (1921).

## 12. White-shouldered Fairy-wren

### *Malurus alboscapulatus*

**French:** Mérion à épaulettes **Spanish:** Maluro Hombroblanco  
**German:** Weißschulter-Staffelschwanz  
**Other common names:** Black-and-white Fairy-wren/Wren-warbler

**Taxonomy.** *Malurus alboscapulatus* A. B. Meyer, 1874, Arfak Mountains, c. 3500 feet [c. 1070 m], Vogelkop, New Guinea.

Protein evidence indicates that closest allies are *M. melanocephalus* and *M. leucopterus*; the three constitute the "bicoloured group". Other proposed races are *randi* (Wissel Lakes region), regarded as better merged with *aida*; *balim* (upper R Balim and upper R Bele areas) and *dogwa* (Merauke F to R Fly), both synonymized with *lorentzi*; and *tappenbecki* (R Sepik F to Astrolabe Bay) and *mafilu* (mountain grasslands in SE New Guinea), both considered better included within *naimii*. Six subspecies currently recognized.

#### Subspecies and Distribution.

*M. a. alboscapulatus* A. B. Meyer, 1874 – Vogelkop (Arfak and Tamrau Mts and intervening valley), in NW New Guinea.

*M. a. aida* E. J. O. Hartert, 1930 – NW New Guinea (Weyland Mts and Wissel Lakes F to Humboldt Bay).

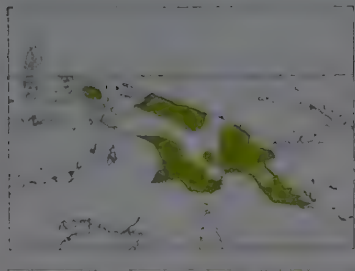
*M. a. lorentzi* van Oort, 1909 – W & S New Guinea (Snow Mts to Trans-Fly and Utaka-Mimika R). *M. a. naimii* Salvadori & D'Albertis, 1875 – N & S lowlands and C highlands of F New Guinea (C Sepik F to Astrolabe Bay; river systems of C highlands; Kerema F to Vanapa R and Wharton Range).

*M. a. kutubu* Schodde & Hitchcock, 1968 – S highlands of C New Guinea (Olsobip F to Mt Giluwe and L Kitubu).

*M. a. moretoni* De Vis, 1892 – N & S coasts of SE New Guinea and intervening mountain valleys (NW to Huon Peninsula, and SW to Brown R and Vanapa R).

**Descriptive notes.** 10–13.5 cm; 8–12 g. Distinctive malurid with comparatively short tail. Male nominate race (all seasons) is entirely glossy black, except for white scapulars; iris, bill and legs black. Female has black head and back, narrow white eyebrow and broken eyering, white scapulars, white underside with variable amount of black flecking; iris and bill as male, legs brown. Juvenile is blackish-grey above, including scapulars, whitish below; immature resembles female but duller, and lacks white on scapulars. Races differ in female and juvenile plumages, to which following





details refer: *naimii* is like nominate, but usually with more black on body side, juvenile as in nominate; *aida* is black like male, but less glossy, wings browner, faint white eyebrow, juvenile all sooty brown; *kamubu* is black like previous, juvenile undescribed; *moretoni* is like previous two, juvenile sooty black or grey with white chin; *lorentzi* female is distinctive, has crown grey-brown, narrow white brow and broken eyering, back mid-brown, no white on scapulars, creamy-white undersurface, cinnamon on flanks, eyes and bill black, legs brown, juvenile as female but paler, with white markings less distinct. Voice. Song a high-pitched

reel lasting 3–4 seconds. Contact call consists of 2–3 notes repeated.

**Habitat.** Inhabits grasslands, typically along river valleys; also canegrass, overgrown village gardens, regrowth, roadside verges, and forest clearings, recorded from sea-level up to 2700 m.

**Food and Feeding.** Arthropods; recorded items include spiders (Araneae), beetles (Coleoptera), grasshoppers (Orthoptera), moths (Lepidoptera) and cicadas (Cicadidae). Forages at low levels, seldom above 2 m. Gleans vegetation. Frequently in groups of several individuals.

**Breeding.** Data sparse, but from specimen labels appears to lay in any month of year, in both wet and dry seasons. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years; one closely monitored group already had two immatures, presumably from earlier breeding, when clutch started in Oct, and another clutch (laid Feb) was attended by breeding male and female, two young adults, and the immature from Oct nest. Oval-shaped nest of coarse grass, sticks and leaves, lined with fine grass, placed 20–150 cm above ground in shrub or grass. No information on clutch size; incubation by female, period 11–12 days; chicks fed by all group-members, leave nest at 12–13 days; fledglings remain concealed for 7–10 days, fed by group for 1 month, remain with family after independence. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*).

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common, and widespread. Appears resilient to clearance, and suited to shifting native garden cultivation. Colonizes newly created forest clear-felling, presumably by following streams.

**Bibliography.** Beehler *et al.* (1986), Bell (1971), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961a, 1970), Nicholson & Coates (1975), Rand (1940a), Ripley (1964a), Rowley & Russell (1997), Schodde (1982).

### 13. Emperor Fairy-wren

#### *Malurus cyanocephalus*

**French:** Mérion empereur **German:** Kaiserstaffelschwanz **Spanish:** Maluro Emperador  
**Other common names:** Blue Wren-warbler, Imperial Wren, Blue/Imperial Fairy-wren, New Guinea Blue-wren/Wren

**Taxonomy.** *Todus cyanocephalus* Quoy and Gaimard, 1830, Manokwari, Vogelkop, north-west New Guinea.

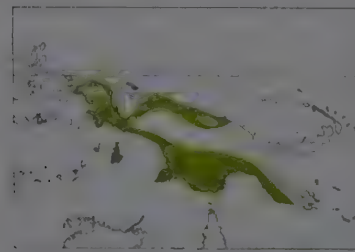
Originally included with *M. grayi* and *Sipodotus wallacii* in a separate genus, *Todopsis*; later placement in present genus supported by protein evidence. Race *bonapartii* intergrades with nominate in Geelvink Bay area. Birds from N New Guinea (E from R Mamberamo) described as race *dohertyi*, but considered inseparable from nominate. Three subspecies recognized.

**Subspecies and Distribution.**

*M. c. cyanocephalus* (Quoy & Gaimard, 1830) – Vogelkop E to Geelvink Bay and N lowland New Guinea (E to mouth of R Ramu).

*M. c. mysorensis* (A. B. Meyer, 1874) – Biak I., in Geelvink Bay.

*M. c. bonapartii* (G. R. Gray, 1859) – Aru Is. and S lowland New Guinea from Geelvink Bay E to E of Port Moresby.



**Descriptive notes.** 13–16 cm; 12–17 g. The largest fairy-wren. Male nominate race (all seasons) has crown light metallic royal blue, forehead, lores and side of head to narrow collar black (no contrastingly coloured ear tufts); upper back, scapulars and uppertail-coverts deep turquoise-blue, lower back blue-black; upperwing and tail blackish with blue tinges; throat and underparts deep navy-blue; iris dark brown; bill black; legs dark grey-brown. Female has head much as male, upperparts chestnut, tail black with broad white tips, throat deep blue, underparts white; eyes and bill as male, legs mid-brown. Immature is basically like female, but with head dusky black, upperparts rusty-brown, entire undersurface white, young male passes through a female-like plumage before attaining full adult plumage. Races differ only in depth of coloration: *mysorensis* is like nominate but has crown light cobalt-blue, female with darker blue crown, *bonapartii* is somewhat darker than others. Voice. Song a reel preceded and followed by series of 4 notes, frequently given by group while foraging. Contact call 'tsi-tsi-tsi-tsi', 'tschik' as alarm.

**Habitat.** Dense secondary growth at edges of forest, also forest openings, riversides, roadsides and overgrown gardens.

**Food and Feeding.** Arthropods; eats beetles (Coleoptera), bugs (Hemiptera), moths (Lepidoptera), grasshoppers (Orthoptera) and spiders (Araneae). Items gleaned from leaves, palm fronds and branches, generally within 1 m of ground. Forages mostly in family parties, not known to join mixed-species flocks.

**Breeding.** Little known, sometimes recorded Mar–Dec, suggesting breeding in all months of year. Socially monogamous but probably sexually promiscuous (as congeners); remains paired throughout year. Co-operative breeder, frequently with helpers, usually progeny from previous years, generally in pairs or small groups of 3 or 4, four males and one female attending recently fledged young. Only one nest found, gourd-shaped with 10-cm entrance, made from strips of fern and leaves woven together with pieces of moss, placed 1 m from ground in a bush, contained 4 young. No other information.

**Movements.** Resident. One male was caught 12 times in 8 years; all captures within 100 m of each other, and with three different females in succession.

**Status and Conservation.** Not globally threatened. Not uncommon. Three groups located within area of 5 ha, appearing to take disturbed conditions.

**Bibliography.** Beehler *et al.* (1986), Bell (1969), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961a, 1970), Rowley & Russell (1997), Schodde (1982).

## Genus *CLYTOMYIAS* Sharpe, 1879

### 14. Orange-crowned Wren

#### *Clytomyias insignis*

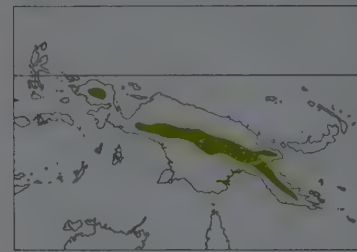
**French:** Mérion à tête rousse **German:** Rotkopf-Staffelschwanz **Spanish:** Maluro Cabecirrojo  
**Other common names:** Rufous Wren-warbler, Orange-crowned/Rufous Fairy-wren

**Taxonomy.** *Clytomyias insignis* Sharpe, 1879, Tjebonda, Arfak Mountains, Vogelkop, New Guinea. Although morphological and protein evidence supports this species' inclusion within present family, they do not clarify its affinities. Two subspecies recognized.

**Subspecies and Distribution.**

*C. i. insignis* Sharpe, 1879 – Arfak Mts, in NW New Guinea (Vogelkop).

*C. i. oorti* Rothschild & E. J. O. Hartert, 1907 – C cordillera of New Guinea.



**Descriptive notes.** 14–16 cm; 10–14 g. Nominative race has crown, face, ear coverts and nape orange-rufous, upperparts olive-brown, upperwing brown, tail light rufous; throat, breast and upper belly creamy white, thighs rufous, lower belly to undertail-coverts pale ochre-grey; iris dark brown; bill broad, black; legs pink-brown. Sexes alike. Immature is duller and darker than adult. Race *oorti* is darker below than nominate, male ochre-tinged buff and female creamy buff. Voice. Song a brief, high-pitched, chattering reel. Contact call sharp, sibilant chirps, similar to those of most *Malurus* species but more frequent; alarm

"chip", like that of *Malurus*.

**Habitat.** Mountain forest, at 2000–3000 m.

**Food and Feeding.** Insectivorous. Observed in groups of 6–8 individuals, including more than two adults, usually in thick cover in subcanopy; gleans from underside of leaves, working over dense foliage regularly and quickly. Rarely flies, but moves rapidly through thick vegetation. Does not join mixed-species flocks.

**Breeding.** No information available.

**Movements.** Sedentary; groups appear to remain in same patch of habitat throughout year.

**Status and Conservation.** Not globally threatened. Locally common in suitable habitat along N & S sides of C mountain chain of New Guinea. Little threatened, since high-mountain forest is presently inaccessible to clear-felling.

**Bibliography.** Beehler (1978b), Beehler *et al.* (1986), Bell (1969), Coates (1990), Diamond (1972), Frith & Frith (1992, 1993b), Harrison (1969a), Mayr (1941b), Mayr & Gilliard (1954), Ripley (1964a), Rowley & Russell (1997), Schodde (1982).

## Genus *STIPITURUS* Lesson, 1831

### 15. Southern Emu-wren

#### *Stipiturus malachurus*

**French:** Queue-de-gaze du Sud **German:** Rotstirn-Borstenschwanz **Spanish:** Maluro Meridional  
**Other common names:** Button-grass Wren, Sticktail

**Taxonomy.** *Muscicapa malachura* Shaw, 1798, Port Jackson = Sydney, New South Wales, Australia. Forms a superspecies with *S. mallee* and *S. ruficeps*; has been treated as conspecific with former. Correct form of subspecies name *polionotum* unclear, as both "*polionotum*" and "*polionota*" quoted in original description; "*polionotum*" provisionally adopted herein, pending published clarification by original describers. Eight subspecies recognized.

**Subspecies and Distribution.**

*S. m. hartogi* Carter, 1916 – Dirk Hartog I., off Western Australia.

*S. m. westernensis* A. J. Campbell, 1912 – SW Western Australia.

*S. m. parimeda* Schodde & Weatherly, 1981 – S Eyre Peninsula, in South Australia.

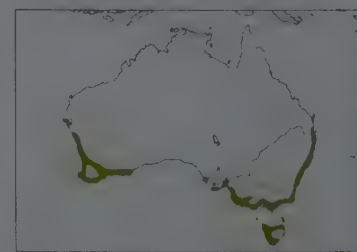
*S. m. halmaturinus* Parsons, 1920 – Kangaroo I., off SE South Australia.

*S. m. intermedius* Ashby, 1920 – Mt Lofty Ranges, in SE South Australia.

*S. m. malachurus* (Shaw, 1798) – SE Queensland coast (from Noosa) S, E of Dividing Range, to SE Victoria (W to Otway Range).

*S. m. polionotum* Schodde & Mason, 1999 – SE South Australia and SW Victoria.

*S. m. littleri* Mathews, 1912 – Tasmania.



**Descriptive notes.** 15.5–19 cm; 5.5–9 g. Small-bodied malurid with tail twice as long as body, filamentous rectrices loosely webbed. Male nominate race is black-streaked rusty brown above, front of crown more rufous and unstreaked, snout evenness sky-blue, ear-coverts light brown, sometimes with paler streaks; upperwing grey-brown, edged rufous, throat and upper breast sky-blue, rest of underparts rufous, whiter on belly; iris brown; bill black; legs brown. Female is as male, but upper surface more streaked, no rufous on forehead, no blue above eye, all reddish-brown below; bill dark brown, with light grey base of lower mandible. Immature is as female, but duller and with more diffuse streaking, bill brown, male (from 5 days of age) has blue-grey throat and breast. Race *littleri* is smaller and more rufous than nominate; *polionotum* is paler, back mid-grey with olive tones; *intermedius* has much darker and



more heavily streaked olive-grey back, male forecrown olive-brown with black streaking; *halmaturinus* is largest, paler, greyer back with fine black streaks, plain dull rufous forecrown; *parimeda* has blue areas paler, back pale olive-grey with fine black streaks, flanks pallid tawny, belly white; *westernensis* has olive-grey back, white-streaked ear-coverts, male with rufous forecrown streaked black, long blue eyebrow extending to lores; *hartogi* is smaller, paler and greyer, streaks on head and back almost absent. Voice. Song a soft descending trill with a few short introductory notes, similar to *Malurus* song but weaker. Contact call a high-pitched, soft "pree-pree", continuously during foraging; alarm a shrill scream, "steet, steet".

**Habitat.** Coastal heaths, swamps, dune thickets, cutting rushes (*Gahnia*) and button-grass (*Gymnoschoenus sphaerocephalus*).

**Food and Feeding.** Insectivorous. Forages by hop-search on ground, with tail held erect; probes vegetation and snatches resting insects. Beats moths (Lepidoptera) to remove wings; splits stems of rushes (*Juncus*) to reach larvae concealed inside. Rarely flies, and keeps in dense cover, especially when windy. In small groups, probably family parties, outside breeding season.

**Breeding.** Aug–Jan; may start second nest c. 8 weeks after first brood fledged. Breeds as a pair; territorial; male helpers present with 8% of pairs. Nest built by female, fed by male during 10-day construction period; a domed oval with side entrance, more spherical than *Malurus* nests, loosely woven from grass and moss, lined with fine grass, plant down and feathers or fur, placed in dense shrub or grass tussock. Clutch 2–4 eggs, mainly 3; incubation by female, period 13–14 days; chicks fed by both parents (and helpers), leave nest at 11–15 days; fledglings keep hidden for a week, become independent at 2 months, remain with parents at least until winter. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*), Shining Bronze-cuckoo (*Chrysococcyx lucidus*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Pallid Cuckoo (*Cuculus pallidus*), Brush Cuckoo (*Cacomantis variolosus*).

**Movements.** Resident. During autumn and winter travels locally in small groups; limited ringing studies reveal movement of up to 1 km.

**Status and Conservation.** Not globally threatened. Locally abundant in suitable habitat; uncommon to rare in parts of range. Restricted races becoming rare as coastal heaths, swamps and dune thickets come under increasing pressure from urban development. In regional assessments of conservation status of races, *intermedius* rated as "Critically Endangered" and both *parimeda* and *hartogi* as "Vulnerable"; conservation of scarce habitat necessary for these taxa.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Fletcher (1913, 1915a), Garnett & Crowley (2000), Higgins *et al.* (2001), Hutton, R. (1991), Maguire (2006a, 2006b), Maguire & Mulder (2004), Maguire *et al.* (2006), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Wilson & Paton (2004).

## 16. Mallee Emu-wren

### *Stipiturus mallee*

**French:** Queue-de-gaze du mallee

**Spanish:** Maluro del Mallee

**German:** Malleeborstenschwanz

**Taxonomy.** *Stipiturus mallee* A. J. Campbell, 1908, Mallee district = Hopetoun district, west Victoria, Australia.

Forms a superspecies with *S. malachurus* and *S. ruficeps*; has been treated as conspecific with former. Often considered conspecific with *S. ruficeps*, but protein evidence supports maintenance of the two as distinct species. Monotypic.

**Distribution.** Mallee region of SE South Australia (S of R Murray) and NW Victoria.



**Descriptive notes.** 13.5–15 cm; 6–7 g. Male has crown unstreaked pale rufous, ear-coverts blue with black streaking, hindneck and upperparts mid olive-brown, streaked black; underparts and tail grey-brown; tail shorter than that of *S. malachurus*, consists of six loosely webbed feathers, central two 1.5 times the length of outer feathers; lores, eyebrow, throat and breast mid sky-blue; rest of undersurface rufous, white at centre of belly; iris dark brown; bill black; legs pinkish-brown. Female resembles male, but without blue colouring, and with rufous confined to forehead, with lores white, ear-coverts grey, throat and

breast tawny. Juvenile is plainer than adult, olive-brown with only faint streaks above, no rufous on crown, greyish-white below; young female more tawny below. Voice. High-pitched twittering reel. Contact call a high-pitched "tree"; alarm a louder "trrt".

**Habitat.** Confined to uncleared, low eucalypt (*Eucalyptus*) mallee woodland with understorey of hummock grass (*Triodia*).

**Food and Feeding.** Poorly known. Eats insects, apparently also seeds. Forages rapidly through shrubs and clumps of *Triodia*, generally within 0.5 m of ground. Lives in family groups for most of year, and may form foraging parties outside breeding season.

**Breeding.** Sept–Nov. Appears to breed as pairs, and probably territorial, but confirmation required. Nest built by female, a domed oval structure with side entrance, made of grass, bark and leaves,

lined with down and feathers, placed in centre of *Triodia* clump. Clutch 2–3 eggs, usually 3; only female incubates eggs and broods chicks. No other information.

**Movements.** Resident. No studies of marked birds; reported as dispersing at least 6 km into vegetation burnt 3–4 years previously.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in South-east Australia EBA. Total population thought to number only c. 3000 individuals around beginning of present century. Clearance of habitat was the greatest threat in the past; recently, frequent extensive fires have eliminated isolated subpopulations, and recolonization after fire not currently possible because of clearance. Core population now found in two areas in Victoria, one being Murray-Sunset National Park and the other Hattah-Kulkyne National Park and adjacent land; densities appear to be higher at latter, but former occupies much larger area; also records from Big Desert Wilderness Park and Wyperfeld National Park, but extensive fires within last decade will probably have reduced numbers greatly. In South Australia, recorded from Billiatt and Ngarkat Conservation Parks; virtually eliminated from Billiatt by fires in 1988, and no records later than 2004; in Ngarkat, four subpopulations were known, but extensive fires in 2005 and 2006 have destroyed c. 50% of known population of park, with habitat unlikely to become suitable again until perhaps in about 10 years' time. Conservation status likely to be upgraded fairly soon to Endangered or perhaps even Critically Endangered.

**Bibliography.** Anon. (2006e, 2006f), Barrett *et al.* (2003), Blakers *et al.* (1984), Butchart & Stattersfield (2004), Cale (2006), Emison *et al.* (1987), Garnett & Crowley (2000), Higgins *et al.* (2001), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Stattersfield & Capper (2000).

## 17. Rufous-crowned Emu-wren

### *Stipiturus ruficeps*

**French:** Queue-de-gaze à calotte rousse

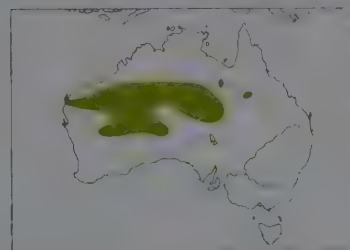
**Spanish:** Maluro Coronirrufo

**German:** Rotscheitel-Borstenschwanz

**Taxonomy.** *Stipiturus ruficeps* A. J. Campbell, 1899, Yardie Creek, western Pilbara, north-west Western Australia.

Forms a superspecies with *S. malachurus* and *S. mallee*. Often considered conspecific with latter, but protein evidence supports maintenance of the two as distinct species. Monotypic.

**Distribution.** From coast of C Western Australia E, in a band between 18° and 28° S (mostly N of L Eyre, in South Australia), to W & C Queensland.



**Descriptive notes.** 10.5–15 cm; 6 g. Smallest and shortest-tailed emu-wren, with filamentous tail c. 1.3 times length of body. Male has crown and nape unstreaked bright rufous, upperparts cinnamon-brown with faint dusky streaks; upperwing greyish-brown, edged rufous, tail (of six closely barbed feathers of nearly equal length) grey-brown; white eyering; lores, ear-coverts, throat and breast deep sky-blue, streaked black (especially on ear-coverts), rest of ventral surface plain buff, tinged rufous; iris, bill and legs brown. Female is similar to male, but without blue colouring, has throat buff (similar to underparts). Juvenile is duller than

adult, dull brown and only faintly streaked above, sexes distinguishable before fledging, male with throat creamy white, female with throat yellowish-buff; immature male has throat and upper breast pale bluish-grey. Voice. Song is a typical malurid reel, high-pitched and weak. Contact call is a continuously repeated high-pitched "tsee, tsee", hard to distinguish from insect noises; alarm a louder "trrt".

**Habitat.** *Triodia* hummock grassland of warm-temperate to subtropical arid zone. Optimum is tall, dense, unburnt *Triodia* association on sand dunes, swales, sand plains, rocky hills with sparse cover of mallee eucalypts (*Eucalyptus*) or low shrubs.

**Food and Feeding.** Little known. Insectivorous. Forages by hop-search and gleaning through spinifex and low shrubs, generally within 0.5 m of ground.

**Breeding.** Aug–Oct, influenced by seasonal conditions; number of broods in season not known. Probably nests as territorial pairs. Nest built by female, woven from grass stems and spider webs, lined with plant down and feathers, placed in top or centre of *Triodia* hummock, usually only 20–25 cm above ground. Clutch size 2 or 3 eggs, possibly more; no data on parental care and on incubation and fledging periods; progeny probably remain with family after independence. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Presumably resident, but status as sedentary may depend on seasonal conditions; no ringing studies.

**Status and Conservation.** Not globally threatened. Locally common. Widespread, but distribution patchy, with scattered populations. Largely dependent on mature *Triodia* clumps, and could, therefore, be vulnerable to excessive, frequent burning.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Campbell (1901), Carter (1903a), Christidis & Schodde (1997), Higgins *et al.* (2001), Hitchcock & Jarman (1944), Rowley & Russell (1997), Schodde (1982).



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PLATE 43



## Subfamily AMYTORNITHINAE

### Genus *AMYTORNIS* Stejneger, 1885

#### 18. Grey Grasswren

##### *Amytornis barbatus*

French: Amytis gris German: Brauengrasschläupfer Spanish: Maluro Gris

**Taxonomy.** *Amytornis barbatus* Favalo and McEvey, 1968, Teurika, Bulloo River, north-west New South Wales, Australia.

Protein evidence indicates that this species stands apart genetically from other grasswrens; interpreted as being an older form. Two subspecies recognized.

##### Subspecies and Distribution.

*A. b. diamantina* Schodde & Christidis, 1987 – Cooper Creek and R Diamantina drainage, in SW Queensland and NE South Australia.

*A. b. barbatus* Favalo and McEvey, 1968 – R Bulloo and Caryapundy Swamp, in extreme SW Queensland and NW New South Wales.



**Descriptive notes.** 18–21 cm; 15–22 g. Medium sized grasswren, very pale with distinctive black-and-white facial markings, very long tail. Male nominate race has white-streaked black crown, white facial area, black eyestripe, white ear-coverts with black V-mark, latter crossing lower throat; upperparts pale cinnamon with black-edged white shaft streaks; tail black; white below, faint grey-black streaks on breast, flanks buff; iris dark brown; bill black or blackish; legs dark grey-brown to greyish-black. Female is very like male, but smaller and duller. Immature is similar to adult. Race *diamantina* is larger than nominate, and redder dorsally.

**VOICE.** Series of high-pitched, ringing, metallic notes, "trip-ip-ip"; lacks elaborate song of other grasswrens, but more vocal. Other calls are a soft trill, and piercing "eep" in alarm.

**Habitat.** Swampy floodplains dominated by lignum (*Muehlenbeckia cunninghamii*) and swamp canegrass (*Eragrostis australasica*), in arid interior.

**Food and Feeding.** Seeds and insects. Feeds on or close to ground, through shrubs and in litter beneath them. In dry seasons, individuals gather in favoured lignum patches.

**Breeding.** Records of nests with eggs or young in Jul–Aug. Appears to breed as territorial pairs; one record of extra bird seen at nest. Nest a loose and bulky structure with slight hood, platform at side entrance, made from grass, lined with fine grass, rootlets and plant down, placed 30–60 cm above ground in centre of lignum or canegrass clump. Clutch 2–3 eggs; no information on parental care and on incubation and fledging periods.

**Movements.** Probably sedentary. Only one study: of 193 marked individuals, 23 recaptured not less than one year later in same area.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Bulloo and Diamantina Rivers Secondary Area. Locally common. Nominative race occurs in a single location that could be subject to catastrophe; regional conservation status "Vulnerable". Race *diamantina* populations are widely scattered. Greatest threat is cattle grazing in poor seasons, as this eliminates all cover.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Carpenter (2002), Chapman (1996), Christidis (1999), Favalo and McEvey (1968), Garnett & Crowley (2000), Hardy (2002), Higgins *et al.* (2001), Jaensch & McFarland (2002), McAllan & Cooper (1995), Parker (1982b), Robinson (1973), Rowley & Russell (1997), Schodde (1982), Schodde & Christidis (1987), Schodde & Mason (1999).

#### 19. Black Grasswren

##### *Amytornis housei*

French: Amytis noir German: Schwarzehl-Grasschläupfer Spanish: Maluro Negro

**Taxonomy.** *Amytis housei* Milligan, 1902, Isdell River, north-west Kimberley region, north Western Australia.

Relationships uncertain. Monotypic.

**Distribution.** W Kimberley (from Mitchell Plateau S to R Isdell), in Western Australia.



**Descriptive notes.** 19–21 cm; 29–35 g. Large, stocky grasswren, with long, broad tail held low. Male has head and upper back black, streaked white, lower back chestnut, tail black; ventral surface black, streaked white on throat, abdomen unstreaked; iris brown; bill black or blackish, often paler base of lower mandible; legs dark grey-brown to black. Female is like male but smaller, with lower breast and belly rufous. Immature is similar to adult. Voice. Not well known. Song short and relatively low-pitched, introductory notes followed by various elements including buzzing vibrato, brief trill, occasional upslurred or downslurred whistle, more varied than *Malurus* song. Contact calls sharp chip sounds, purrs, "seep", alarm a loud "uk" or rattle.

**Habitat.** Confined to tumbled sandstone escarpments, gorges and outcrops of Kimberley Plateau, where predominant ground cover is *Triodia* hummock grass.

**Food and Feeding.** Eats insects and seeds, especially seeds of grasses. Forages on ground among rock crevices and around edges of *Triodia*; rarely flies and, unlike other grasswrens, tail seldom held cocked.

**Breeding.** Nests in Dec–Mar wet season. Probably co-operative breeder; frequent reports of groups up to six individuals, including more than two adults. Large, bulky nest globular or domed, with side entrance and landing platform, built of interwoven *Triodia* stems, leaves and rootlets (thick walls protect it from rain), lined with dry leaves and fine grass, sited less than 50 cm above ground in or on top of *Triodia* clump. Clutch 1–2 eggs; incubation by female, nestlings fed by both parents and by any helpers present; no information on duration of incubation and nestling periods; fledglings probably remain with group after reaching independence.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in North-west Australia EBA. Abundant within its limited distribution, and no evidence of change in numerical status. Recorded densities of 10 nests in 3 km<sup>2</sup> and 16 pairs in 2-km transect. Overly frequent fires could affect this species' numbers, but rugged terrain in which it lives affords protection.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Chapman (1996), Christidis (1999), Freeman (1970), Garnett & Crowley (2000), Higgins *et al.* (2001), Johnstone & Kolliehis (1999), Johnstone & Storr (2004), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999).

#### 20. White-throated Grasswren

##### *Amytornis woodwardi*

French: Amytis à gorge blanche German: Weißkehl-Grasschläupfer Spanish: Maluro Gorjiblanco

**Other common names:** Larger White-throated/Spinifex/White-chested Grasswren

**Taxonomy.** *Amytornis woodwardi* E. J. O. Hartert, 1905, east of South Alligator River, west Arnhem Land, Northern Territory, Australia.

Forms a superspecies with *A. dorotheae*; other relationships uncertain. Monotypic.

**Distribution.** N Northern Territory (C & W Arnhem Land), in N Australia.



**Descriptive notes.** 20–22 cm; 29–35 g. Large-sized grasswren, with long, broad tail. Male has head to mantle mostly black with white shaft streaks, grading to chestnut on back and rump; upperwing blackish, edged chestnut, tail black; strong black malar stripe (whisker-mark); throat and breast white, separated from tawny belly by band of black-edged feathers; iris brown; bill dark grey with black tip and culmen ridge; legs grey. Female is similar to male, but belly deeper chestnut. Immature is as adult, but duller. Voice. Song a sweet-sounding extended variable sequence of upslurred and downslurred notes, trills and buzzes, including very high frequencies; carries well. Contact call a high-pitched "peep"; alarm a sharp "sit".

**Habitat.** Bare flat plateaus and stepped or terraced hillside along broad valleys, both with bare rock and with *Triodia* hummock grass.

**Food and Feeding.** Eats stems of grasses and sedges, also seeds and insects. Forages on ground by gleaning and hop-search, mostly over bare rock and in the litter of *Triodia* clumps. Lives in small groups.

**Breeding.** Nests in Dec–Jun, during and after wet season; may raise two broods in one season. Probably co-operative breeder, groups of three and four individuals observed to attend nestlings and fledglings. Nest bulky, domed, with thick roof and side entrance, built of interwoven grass stems, fine leaves and paperbark (*Melaleuca*) bark, lined with fine grass, placed low down in clump of *Triodia*. Clutch 2 eggs; no information on incubation and nestling periods; young reach independence c. 1 month after fledging, and remain in natal group.

**Movements.** Sedentary.

**Status and Conservation.** VULNERABLE. Restricted-range species: present in North-west Australia EBA. Fragmented populations appear to consist of separate groups with large home ranges. Restricted habitat is increasingly being burnt by hot fires at end of dry season, and *Triodia* is being progressively replaced by annual sorghum (*Sorghum*). Conservation requires monitoring of populations and intensive management of fires.

**Bibliography.** Anon. (2006e), Barrett *et al.* (2003), Blakers *et al.* (1984), Butchart & Stattersfield (2004), Chapman (1996), Christidis (1999), Garnett & Crowley (2000), Higgins *et al.* (2001), Noske (1991a, 1992), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1975a, 1999), Stattersfield & Capper (2000).

#### 21. Carpentarian Grasswren

##### *Amytornis dorotheae*

French: Amytis de Dorothy German: Carpentariagrasschläupfer Spanish: Maluro de Carpentaria

**Other common names:** Dorothy's/Lesser White-throated/Red-winged/Spinifex/Carpenter Grasswren

**Taxonomy.** *Magnamytis woodwardi dorotheae* Mathews, 1914, Macarthur River, north-east Northern Territory, Australia.

Forms a superspecies with *A. woodwardi*; other relationships uncertain. Monotypic.

**Distribution.** E Northern Territory and NW Queensland (inland from S Gulf of Carpentaria), in N Australia.

**Descriptive notes.** 16–17.5 cm; 21–25 g. Medium sized grasswren. Male has blackish head grading to rufous on back, all with black-edged white shaft streaks, lower back to uppertail-coverts unstreaked rich rufous; upperwing and tail dusky brown with rufous edging; strong black malar stripe (whisker-mark); breast and upper belly white, grading to tawny on lower belly and flanks; iris dark brown to reddish-brown; bill dark grey to blackish, paler blue-grey base; legs grey. Differs from *A. woodwardi* in smaller size, slimmer build, more rufous plumage, more extensive white below, no streaked breastband. Female is as male except that flanks and lower belly are deep chestnut. Immature resembles adult. Voice. Song loud, sweet-sounding, consists of varying combinations of trills, buzzes and melodious phrases, some very high frequencies. Contact calls high-pitched cricket-like chirps; alarm a loud "tzzt".





**Habitat.** Dissected sandstone ranges with *Triodia* hummock grassland or low open woodland, preferably long unburnt.

**Food and Feeding.** Insects and seeds. Forages on the ground, searching rock crevices and litter under shrubs.

**Breeding.** Probably lays in any month if conditions good. Probably co-operative breeder, several accounts of groups of 3–4 adults. Nest built of interwoven stems of *Triodia* and other grasses and leaves, lined with finer grasses, 20–60 cm above ground and embedded in top of *Triodia* clump. Clutch 2–3 eggs; no information on incubation and nesting periods; young apparently

remain with family after independence. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*). **Movements.** Probably sedentary, foraging over large home range. No studies of marked individuals. **Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Gulf of Carpentaria Secondary Area. Uncommon to locally common. More widespread than was hitherto thought, and no evidence of decline at present. Frequent burning of habitat to produce pasture for cattle appears to eliminate this species, which prefers grassland that has remained unburnt for a long time. Conservation requires regular monitoring of populations, and fire management that favours the species.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Chapman (1996), Christidis (1999), Garnett & Crowley (2000), Higgins *et al.* (2001), McKean & Martin (1989), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Whitaker (1987).

## 22. Short-tailed Grasswren

### *Amytornis merrotsyi*

**French:** Amytis de Merrotsy **German:** Kurzschwanz-Grasschläupfer **Spanish:** Maluro Colicorto  
**Other common names:** Chestnut-mantled Grasswren

**Taxonomy.** *Amytornis merrotsyi* Mellor, 1913, Yudnamutana, northern Flinders Ranges, South Australia.

Forms a superspecies with *A. striatus*. Until recently considered conspecific, but falls outside range of intraspecific variation found in latter species, and possibly sympatric with it in Gawler Ranges; separation at species level further supported by protein evidence. Monotypic.

**Distribution.** Gawler Ranges and Flinders Ranges, in South Australia.



**Descriptive notes.** 15–16 cm; 23 g. Medium-sized grasswren with comparatively short tail. Male is dark rufous with black-and-white streaking above, indistinct dull rufous-brown anterior supercilium; vestigial black malar stripe (whisker-mark) with white flecking, merging with white-streaked dusky ear-coverts; buff below, grey streaks on breast; iris dark brown; bill dark grey to blackish, often paler or blue-grey base of lower mandible; legs grey to blackish. Differs from *A. striatus* mainly in much shorter tail, stouter bill and longer legs, less distinct malar stripe, somewhat brighter rufous coloration. Female is as male, but with

deep rufous patch on each side of lower breast, and streaks on breast more marked. Immature undescribed. Voice. Few details; said to differ from *A. striatus*. Contact call ■ high-pitched “see”, sometimes repeated; squeaky alarm call when flushed.

**Habitat.** *Triodia* hummock grass on stony hillsides, ridges, rocky gulleys and gorges, usually with overstorey of trees or shrubs. Returns to burnt habitat c. 5 years after fire, density peaking at 7 years.

**Food and Feeding.** No information; probably as for *A. striatus*. Occurs singly or in small groups.

**Breeding.** Few confirmed data. Probably as for *A. striatus*.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common. Has patchy distribution within small range; subpopulations could be extirpated by fire if latter too frequent. Conservation requires careful management of grazing and fire regimes.

**Bibliography.** Barrett *et al.* (2003), Baxter & Paton (1998), Blakers *et al.* (1984), Chapman (1996), Christidis (1999), Garnett & Crowley (2000), Higgins *et al.* (2001), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999).

## 23. Striated Grasswren

### *Amytornis striatus*

**French:** Amytis strié **German:** Streifengrasschläupfer **Spanish:** Maluro Estrigado  
**Other common names:** Spotted Striped Grasswren, Rufous Grasswren (whiter)

**Taxonomy.** *Dasyornis striatus* Gould, 1840, Liverpool Plains (possibly on lower Namoi River), New South Wales, Australia.

Forms a superspecies with *A. merrotsyi*. Until recently considered conspecific, but latter falls outside range of variation found in present species, and the two are possibly sympatric in Gawler Ranges; separation at species level further supported by protein evidence. Proposed race *owenii* (described from C Western Australia) considered to fall within range of variation of nominate. *Tamias striatus* (Gould, 1840).

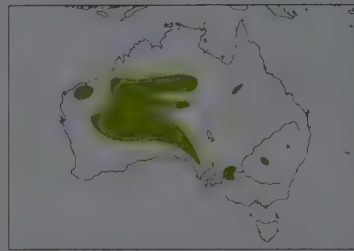
**Subspecies and Distribution.**

*A. s. whitei* Mathews, 1910 – Pilbara region of W Western Australia.

*A. s. striatus* (Gould, 1840) – from C Western Australia E to C & S Northern Territory, NW, C & SE South Australia, and NW Victoria, and inland New South Wales (including R Namoi).

*A. s. rowleyi* Schodde & Mason, 1999 – C uplands of Cooper–Diamantina Basin, in C Queensland.

**Descriptive notes.** 14–19 cm, 15–24 g. Medium-sized grasswren with relatively slender bill, long tail. Male nominate race has white lores, rufous anterior eyebrow; crown and upperparts greyish-brown with blackish and white shaft streaks; nape and back more cinnamon-rufous; underparts and tail brown (tail more rufous in NW); broad black malar stripe (whisker-mark); below white-streaked dusky ear-coverts; chin and throat white to greyish-cream,



underparts pale buff, grey streaks on upper breast; iris dark brown; bill dark grey, darker on tip and culmen; legs dark grey to greyish-brown. Differs from *A. merrotsyi* mainly in much longer tail, slimmer bill, more distinct malar stripe, less rufous coloration. Female is as male but has prominent rufous patch at side of breast. Immature is similar to adult. Race *whitei* is brighter than nominate, back with deep rufous ground colour, underparts deeper buff; *rowleyi* is much smaller than others, with shorter tail, is rufous dorsally like previous, but with breast and belly pale cream. Voice.

Song a staccato “tew, tew, tew” followed by

melodic liquid ripple of trills and buzzes. Contact call a single high “seep”; alarm a sharp “tchirr”. **Habitat.** *Triodia* associations, with or without overstorey of shrubs or mallees (*Eucalyptus*), on sand plains, dunes or rocky hillsides throughout arid and semi-arid regions.

**Food and Feeding.** Insectivorous and granivorous; food mostly beetles (Coleoptera), ants (Formicidae), and seeds of *Triodia*. Forages mostly on ground, especially in leaf litter beneath shrubs and around bases of *Triodia* clumps. In pairs or small groups; occasionally singly.

**Breeding.** Aug–Jan, and also in other months in response to rainfall; in captivity (with abundant food), bred Feb–May, Aug and Nov, female reneesting 4–5 weeks after first brood had fledged. Of 18 breeding groups in the only known field study, 15 consisted of pairs and three had an additional member, latter suggesting co-operative breeding. Nest built by female, oval, domed, with side entrance, woven from grass stems, *Triodia* spines, and strips of bark, lined with finer grasses, placed usually at edge or top of *Triodia* clump; breeding territory c. 3 ha. Clutch 2–3 eggs; incubation 14 days; chicks fed by both parents, nestling period 14 days; fledglings also fed by both parents, independent at 4 weeks, but probably stay with family.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. Nominant race has declined in SE of range, where suitable habitat has been greatly reduced by clearance, which still continues. Races *rowleyi* and *whitei* appear not to be at any risk. Conservation requires cessation of land clearance, coupled with management of grazing and fire in such a way as to minimize loss of mature *Triodia*, especially in mallee woodlands.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Carter (1903a), Chapman (1996), Christidis (1999), Ford (1987a), Garnett & Crowley (2000), Higgins *et al.* (2001), Hutton, R. (1991), Karubian (2001), McAllan (1987), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Whitlock (1910).

## 24. Eyrean Grasswren

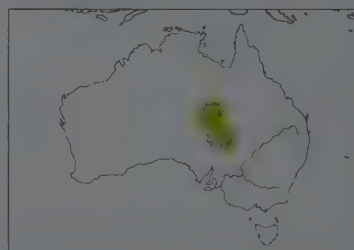
### *Amytornis goyderi*

**French:** Amytis de l'Eyre **German:** Eyregrasschläupfer **Spanish:** Maluro del Eyre  
**Other common names:** Goyder's Grasswren

**Taxonomy.** *Amytis goyderi* Gould, 1875, Macumba River, northern South Australia.

Relationships uncertain. Monotypic.

**Distribution.** Dunefields of Simpson Desert and Strzelecki Desert, in SE Northern Territory, extreme SW Queensland and NE South Australia.



**Descriptive notes.** 15–16.7 cm; 15–19 g. Small, pale grasswren with massive bill deeper than it is wide, like that of a finch (Fringillidae). Male has upper surfaces cinnamon-brown with brown-edged whitish shaft streaks; upperwing and tail brown with rufous edges; vestigial black malar stripe (whisker-mark) obscured by streaking, merging into striped ear-coverts; throat white, underparts dull white, flanks pale rufous; iris brown; bill light grey to blue-grey, darker on culmen; legs purplish-grey to blackish. Female is as male, but with chestnut flanks. Juvenile resembles adult but fluffier, duller, browner and less clearly streaked above, tail

feathers with warmer rufous edges, no dark malar stripe; immature very similar to adult of respective sex. Voice. Song a sweet-sounding warble of varied short syllables, some very high-pitched. Contact call “seep”; alarm “zeet”.

**Habitat.** Tussock grassland of sandhill canegrass (*Zygochloa paradoxa*) on crests and upper slopes of sand dunes. Appears sympatric with race *diamantina* of *A. barbatulus* in the swales between dunes.

**Food and Feeding.** Eats seeds, mostly of the grasses *Zygochloa* and *Aristida*; also insects and spiders (Araneae). No more granivorous than other grasswrens; massive bill may have evolved to cope with large canegrass seeds. Largely terrestrial. Forages on or close to ground, searching at edges of or inside clumps of canegrass and other vegetation. Hops and runs, rarely flies; bounces over open ground, with tail held cocked, leaving characteristic footprints, one foot slightly behind the other.

**Breeding.** Few available data suggest breeding from late winter to early spring, in Jul–Sept, especially after rain. Nest compact, globular, semi-domed, of strips and stems of grass, lined with finer grass and plant down, placed 10–80 cm above ground among stems of *Zygochloa* tussock. Clutch 2–3 eggs; no information on incubation and nesting periods, but probably very similar to those of *A. striatus*; groups consisting of more than a simple pair may indicate that progeny stay with family.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Simpson and Strzelecki Deserts Secondary Area. Rather uncommon. Population in Simpson Dune field linked to that in Strzelecki Dune field, numbers probably fluctuate with drought cycles. Chief hazard is grazing of habitat by exotic herbivores, camels (*Camelus*), horses (*Equus*) and rabbits (*Oryctolagus*).

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Chapman (1996), Christidis (1999), Colic & Grogan (1987), Garnett & Crowley (2000), Higgins *et al.* (2001), May (1977), Parker (1982b), Parker *et al.* (1978), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999).

## 25. Thick-billed Grasswren

### *Amytornis textilis*

**French:** Amytis natté **German:** Dickschnabel-Grasschläupfer **Spanish:** Maluro Picogordo

**Other common names:** Western/Large-tailed Grasswren (nominate and *myall*); Eastern Grasswren (*modestus*)

**Taxonomy.** *Malurus textilis* Dumont de Sainte Croix, 1824, Peron Peninsula, Shark Bay, Western Australia.

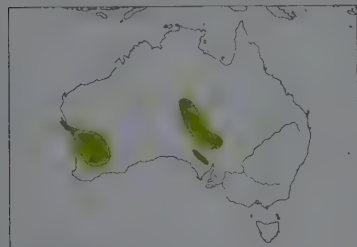
Relationships uncertain. Has sometimes been treated as conspecific with *A. purnelli*. Has been suggested, on basis primarily of morphological differences, that race *modestus* represents a separate species. Three subspecies recognized.

**Subspecies and Distribution.**

*A. t. textilis* (Dumont de Sainte Croix, 1824) – Shark Bay region, in Western Australia.

*A. t. modestus* (North, 1902) – extreme S Northern Territory (Macdonnell Ranges) and N & C South Australia (L Eyre–L Frome basin).

*A. t. myall* (Mathews, 1916) – N Eyre Peninsula (including Gawler Ranges), in South Australia.



**Descriptive notes.** 15–20 cm; 18–23 g. Rather dull grasswren with stout, blunt bill. Male nominate race is fairly dark grey-brown with black-edged white shaft streaks above; long tail dark grey-brown; pale fawn-brown below, white streaks on chin and breast; iris brown; bill black or blackish, paler blue-grey base of lower mandible; legs grey to blackish. Female is like male, but with chestnut patch at side of breast. Immature is similar to adult. Race *myall* is somewhat darker than nominate; *modestus* is smaller than others, with much shorter tail, slightly deeper but shorter bill, also duller plumage with less distinct streaks. **VOICE.** Song includes series of short “pip” notes, downslurred whistles and short trills. Contact calls soft twittering trills and louder “chet”; alarm a short, sharp “tik”.

**Habitat.** Shrublands in arid and semi-arid regions; important plants in habitat are saltbush (*Atriplex*), bluebush (*Maireana*), acacia (*Acacia*), *Ptilotus* and *Thryptomene*.

**Food and Feeding.** Omnivorous: eats seeds, fruits, and insects and other invertebrates. Forages mainly on ground, gleaning in leaf litter under and around bases of shrubs.

**Breeding.** Breeds in Jul–Oct in Western Australia (nominate race), and after suitable rainfall elsewhere in range. Adults additional to breeding pair seen at some nests; co-operative breeding when population densities high. Nest built by female, partly domed and with thick walls, of grass, twigs and strips of bark, lined with fine grass and plant down, placed 30 cm above ground in centre of shrub. Clutch 2 eggs, laid at intervals of more than 1 day; incubation by female, period 15–17 days; chicks fed by both parents, nestling period 10–14 days; fledglings remain concealed for 1–2 weeks. Nests parasitized by Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Sedentary, remaining on territory throughout year; maximum recorded dispersal of fledgling 400 m.

**Status and Conservation.** Not globally threatened. Locally fairly common to uncommon. In regional assessments of conservation status at the subspecific level, all three races were rated as “Vulnerable”. Nominate race once widespread in arid and semi-arid SW Australia from coast of Western Australia (Shark Bay, including Dirk Hartog I) E to W South Australia (E part of Nullabor Plain), but range has contracted greatly, now reduced to Shark Bay region only; this race is quite common in small area to which now restricted, especially on Peron Peninsula, where extensive predator control is enforced over a large national park. Race *modestus* has also suffered considerable reduction in range, having once extended E to C New South Wales; now restricted to region of L Eyre (chiefly in South Australia), and not common. Range of race *myall* was probably never extensive, and now reduced. Overgrazing by domestic livestock and rabbits (*Oryctolagus*) and consequent loss of cover have caused population declines in the past; there is also a need to focus attention on control of exotic predators. As in all taxa with restricted distributions, extensive wild-fire is also a major threat.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker, B. (1998a, 1998b, 2000), Brooker, M.G. (1988), Carter (1917), Chapman (1996), Christidis (1999), Curry (1986), Garnett & Crowley (2000), Higgins *et al.* (2001), Johnstone & Storr (2004), McAllan (1987), Parker (1972, 1982b), Rowley & Russell (1997), Saunders & Ingram (1995), Schodde (1982), Schodde & Mason (1999), Whittlock (1910, 1921, 1924).

## 26. Dusky Grasswren

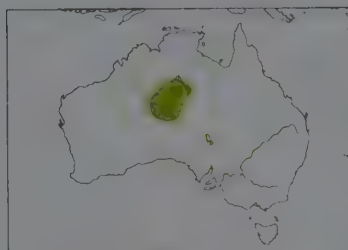
### *Amytornis purnelli*

**French:** Amytis de Purnell **German:** Zimtgrasschläupfer **Spanish:** Maluro Sombrio  
**Other common names:** Dark/Buf-throated/Thin-billed/Western Grasswren, Rock Wren

**Taxonomy.** *Diaphorillas textilis purnelli* Mathews, 1914, Mount Benstead, Alice Springs, south Northern Territory, central Australia.

Probably forms a superspecies with *A. ballarae*; until recently treated as conspecific, but the two exhibit significant morphological differences, and separation at species level supported by protein evidence. In the past, was sometimes treated as a race of *A. textilis*. Monotypic.

**Distribution.** C Australian mountain ranges from NC Northern Territory (S from Ashburton Range, E to Jervois Range and Harts Range) S to E Western Australia (W to Rawlinson and Tomkinson Ranges) and N South Australia (S to Birksgate and Everard Ranges).



**Descriptive notes.** 15.5–18 cm; 18–25 g. Medium-sized long-tailed grasswren. Male has face dusky rufous with white streaks, no obvious facial markings; dull rufous-brown above, with narrow white shaft streaks with indistinct black edges; upperwing and tail brown with rufous edges; throat and breast dull rufous with whitish streaks, grading to dark rufous-brown on belly; iris dark brown; bill grey-black, usually paler blue-grey base of lower mandible; legs dark grey. Differs from *A. textilis* mainly in having finer bill, and darker throat and underparts. Female is as male, but with patch of dark rufous on flanks. Immature is similar to

adult. **VOICE.** Song a series of varied short trills, lasting 2–3 seconds. Contact call “seet”, also soft twittering trills; alarm “tchk, tchk”.

**Habitat.** Sparse open woodland with spinifex (*Triodia*) ground layer in rocky gorges and ridges of isolated ranges in arid interior.

**Food and Feeding.** Few data. Seeds, fruits, and insects and other invertebrates. Food items gathered mainly from the ground.

**Breeding.** Not studied. Suggested as probably laying Jul–Oct, although may respond to rainfall at other times. Comparatively large, half-domed nest of dried grass, lined with shredded grass and fibre, set in middle of *Triodia* clump; 2–3 eggs, incubated by female. No other data available.

**Movements.** Thought to be sedentary; no ringing studies.

**Status and Conservation.** Not globally threatened. Locally common. Fragmented distribution, confined to rocky ranges, and little affected by grazing or fire. Was for many years confused with *A. textilis*, and any changes in range therefore possibly obscured.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Chapman (1996), Christidis (1999), Condon (1968), Garnett & Crowley (2000), Goodwin (1967), Higgins *et al.* (2001), Hitchcock & Jarman (1944), Parker (1972, 1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999), Whittlock (1924).

## 27. Kalkadoon Grasswren

### *Amytornis ballarae*

**French:** Amytis kalkadoon **German:** Graufinken-Grasschläupfer **Spanish:** Maluro Kalkadoon  
**Other common names:** Grey-bellied Grasswren

**Taxonomy.** *Amytornis textilis ballarae* Condon, 1969, 6 miles [c. 10 km] south of Mary Kathleen, near Ballarae copper mine, south-east of Mount Isa, north-west Queensland, Australia.

Probably forms a superspecies with *A. purnelli*; until recently treated as conspecific, but the two exhibit significant morphological differences, and treatment as separate species supported by protein evidence. Monotypic.

**Distribution.** Selwyn Range, SE of Mt Isa (NW Queensland), in N Australia.



**Descriptive notes.** 14.7–15.9 cm; 20–25 g. Medium-sized grasswren with long tail. Male has face dusky rufous with white streaks, no obvious facial markings; bright rufous-brown above, white shaft streaks with clear black edges on head and neck; upperwing and tail grey-brown; throat and breast straw-coloured with dusky-edged white shaft streaks (feathers stiff and pointed), belly grey; iris dark brown; bill dark grey to blackish, dark blue-grey base of lower mandible; legs dark grey. Differs from *A. purnelli* in smaller size, brighter coloration, stiff tips of throat feathers. Female is as male, but with large dark rufous area along flanks.

Immature undescribed. **VOICE.** Song a series of high-pitched, varied short trills. Contact calls single high-pitched squeaks; alarm a loud squawk.

**Habitat.** Occupies ground layer of spinifex (*Triodia*) on rocky hillsides, ridges and gulleys in arid country.

**Food and Feeding.** Insects and seeds eaten in roughly equal proportions. Forages in rock crevices and under *Triodia* clumps. Occurs in pairs or small groups.

**Breeding.** Jul–Oct. Probably a co-operative breeder; one record of three birds at a nest with feathered nestlings, and groups of 3–10 individuals seen at all times of year. Nest of grass stems and fine twigs, well concealed 50 cm above ground near top of a clump of *Triodia*. Clutch 1–3 eggs; no data on incubation and nestling periods; both parents feed nestlings.

**Movements.** Probably sedentary.

**Status and Conservation.** Not assessed. Confined to rocky areas of NW Queensland. Frequency of fires may cause population decline as *Triodia* becomes reduced, but scattered populations unlikely to be affected simultaneously.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Carruthers *et al.* (1970), Chapman (1996), Christidis (1999), Glass (1973), Higgins *et al.* (2001), Horton (1975), Parker (1982b), Rowley & Russell (1997), Schodde (1982), Schodde & Mason (1999).

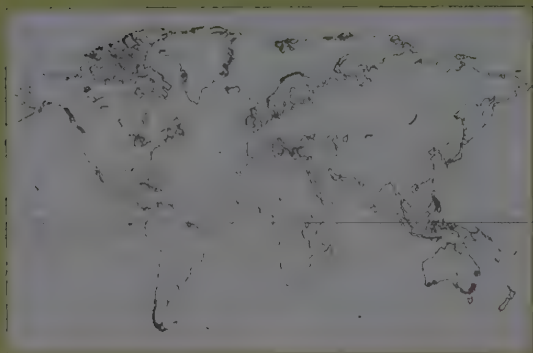


## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family DASYORNITHIDAE (BRISTLEBIRDS)



- Medium-sized passerines with long graduated tail, short and rather rounded wings, fairly long, pointed and stout bill with stiff rictal bristles at base, quite stout legs and feet; dull plumage of brown and grey with some rufous, variable pale spotting, streaking or scaling.
- 17–25 cm.



- Australia.
- Dense, low vegetation in heathland and shrubland to forest.
- 1 genus, 3 species, 5 taxa.
- 2 species threatened; one subspecies extinct since 1600.

**Systematics**

The bristlebirds form a small, coherent and divergent group of three species that has usually been considered to constitute a subfamily, the Dasyornithinae, within the thornbill family (Acanthizidae), with the Pilotbird (*Pycnoptilus floccosus*) seen as a link between the bristlebirds and the rest of the acanthizids. Despite some similarities in morphology, habits and voice, however, there seems no reason why the Pilotbird should not equally be regarded as an example of convergence from among the acanthizids, thus leaving the bristlebirds as a distinct and probably ancient relict assemblage. It would be desirable to have the phylogeny of the bristlebirds elucidated by DNA studies, but in the meantime it is probably best to follow the classification set out in the most recent edition of the *Howard and Moore Complete Checklist*, published in 2003, and to treat the bristlebirds as a distinct family, the Dasyornithidae.

The taxonomy of the group is complex and has been reviewed by various authorities. Most notable have been the studies undertaken in the 1980s by C. G. Sibley and J. E. Ahlquist, using DNA-DNA hybridization techniques, and those carried out in the 1990s by L. Christidis and others, who analysed protein allozymes. The latter work indicated that, contrary to all previous assumptions, the origins of the group did not lie in the Northern Hemisphere but, rather, within the great Australo-Papuan corvid lineage, a quite separate and very ancient radiation. This benchmark discovery has revolutionized evolutionary studies. Both the thornbills and the bristlebirds are sometimes incorporated with the pardalotes in a greatly expanded family Pardalotidae, in which they are treated as two separate subfamilies, the Acanthizinae and the Dasyornithinae. This was the preferred classification of Sibley and Ahlquist in 1990, and was followed by Christidis and W. E. Boles in 1994, but recent research does not support this arrangement and future developments will surely see more revisions. Indeed, studies by R. Schodde and I. J. Mason indicate that *Pardalotus* is a divergent genus, and not part of a broad assemblage with the bristlebirds and the thornbills, thus supporting its recognition as constituting a separate, monogeneric family. Genomic distances between the pardalotes and the others are large, and the two groups exhibit substantial differences in morphology and behaviour, including wing structure, osteology, plumage patterns, and breeding behaviour. This same logic can be applied also to the separation of the bristlebird genus, *Dasyornis*, from the rest of the Acanthizidae. J. Cracraft, author

of the family lists in the most recent *Howard and Moore Complete Checklist*, agreed with the separation of the Pardalotidae and, furthermore, accorded family status to the three bristlebirds.

Some of these studies also indicate that Dasyornithidae is a member of a superfamily Meliphagoidea, along with the honeyeaters (Meliphagidae) and the fairy-wrens (Maluridae). This finding is very different from those of earlier studies, which placed them variously among the Old World warblers (Sylviidae) or the babblers (Timaliidae), or together with the fairy-wrens as a subfamily Malurinae of the Old World flycatchers (Muscicapidae). It is quite likely that the nearest relatives of the Dasyornithidae are the pardalotes, the acanthizids, the honeyeaters and the fairy-wrens.

As a group, the bristlebirds occupy a highly specialized relict niche within Australia. Two species are now basically conservation-dependent, and only the Rufous Bristlebird (*Dasyornis broadbenti*) is still fairly common within its relatively small range in coastal south-east Australia (see Status and Conservation).

The Western Bristlebird (*Dasyornis longirostris*) is monotypic, whereas the two other species are polytypic, each consisting of two subspecies. The Rufous Bristlebird formerly included a third subspecies, *litoralis*, but this is presumed now to be extinct (see Status and Conservation). This last-mentioned race was geographically remote from the other two, in addition to which it was said to have a distinct song, although details of this are scant. It seems that the taxonomic significance, if any, of this alleged vocal difference will remain unknown.

**Morphological Aspects**

Bristlebirds are medium-sized, dull-plumaged, long-tailed and very skulking species of dense thickets and undergrowth. The bill is quite long, pointed and fairly stout, and is used for probing and picking in the leaf litter. The vernacular name of "bristlebird" is derived from the stiff rictal bristles at the base of the bill, the function of which is, however, uncertain. The legs and feet are quite stout, as these species spend a lot of time on the ground, being able to run rapidly and seldom flying, although, curiously, the feet seem not to be used for scratching among the leaf litter. The wings are short and rather rounded, having ten primaries and nine secondaries, with a vestigial tenth secondary. Accordingly, the scientific specific name of the Eastern Bristlebird (*Dasyornis brachypterus*) means "short-winged", and the spe-

cies was originally known as the "Short-winged Thrush". Not surprisingly, the bristlebirds have reduced powers of flight, as befits very sedentary inhabitants of dense undergrowth. The tail, which is frequently cocked, has twelve long and tapered rectrices.

Modest plumage coloration is a further characteristic of the bristlebirds. All three species are predominantly brown, with some limited rufous colour, and have variable pale spotting, streaking or scaling. The long tail is plain rufous, the feathers lacking dark subterminal bands or pale tips. The sexes are the same in all cases, and there is no seasonal variation in plumage.

Bristlebirds bear a rather strong resemblance to another ancient Australian relict family, the scrub-birds (Atrichornithidae), which also dwell in dense damp undergrowth, albeit in slightly different habitats in rainforest and tall wooded heaths. These, however, have a much flatter head, with an arched nasal bone that tapers into a long, stout and pointed bill. In addition, their plumage is more heavily marked and patterned, with black vermiculations, and, unlike the bristlebirds, they display sexual dimorphism in plumage.

### Habitat

All three bristlebirds, which have non-overlapping distributions, require dense vegetation formations. The Western Bristlebird has the most specialized habitat requirements within the family. This species is found in a tiny area of coastal south-west Western Australia, from near Albany eastwards to the Stirling Ranges. It is restricted to dense closed coastal heathland, and more open heath where dense clumps or thickets occur. These heath formations are floristically diverse and 0.5–1.5 m tall, with banksias (*Banksia*), paperbarks (*Melaleuca*), hakeas (*Hakea*), tea-trees (*Leptospermum*), *Dryandra*, dwarf sheoak (*Allocasuarina humilis*), basket-flower (*Adenanthos*) and *Lambertia*; often they have abundant sedges such as *Gahnia*, *Cyathochaete*, *Lepidosperma* and sword-sedge (*Anarthria*) growing between the shrubs; grass-trees (*Xanthorrhoea*) are also present. Western Bristlebirds can also be found in heathland below eucalypt (*Eucalyptus*) stands, and along densely vegetated drainage lines in more open heath. Such heaths are very vulnerable to fire, and following burn-

ing they may take 5–14 years to regenerate sufficiently to be suitable for bristlebirds, although in wetter habitats, as at Two Peoples Bay, the period may be only 3–6 years. Regenerated heath can remain suitable for the species for at least 50 years, so long as it remains unburnt, but the bristlebird's population density may be reduced over time once an optimal period has passed. Following wildfires, the birds may survive in unburnt patches, with swampy vegetation likely to provide significant refugia from which recolonization can begin.

On the opposite side of Australia, the Eastern Bristlebird is found in a few relict pockets in far south-east Queensland and extreme north-east New South Wales, and on the coast and ranges around the Sydney catchment area southwards to the Victoria border. It occupies a wide range of low, dense habitats, including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. As its western congener, this species prefers dense, floristically diverse formations and can occur in thick understorey beneath trees or shrubs. The northern subspecies *monoides* is usually encountered in open forest with dense grassy understorey, particularly in the ecotone near rainforest. The ground layer is usually 95–145 cm tall, with dense tussocks of wild sorghum (*Sorghum leiocladum*) a favourite, but also blady grass (*Imperata cylindrica*), snow grass (*Poa sieberiana*), kangaroo grass (*Themeda triandra*), ferns, vines and shrubs.

Fire is likely to be a necessity in maintaining this type of habitat, because, without burning, the trees would become very dense and would shade out the grass component. Overly frequent burning, however, can lead to the development of a habitat that is too open, and the northern subspecies of the Eastern Bristlebird has had to evolve effective ways of surviving in such a fire-dependent environment (see Status and Conservation).

The Rufous Bristlebird inhabits primarily low, dense shrubland and heathland on coastal dunes and cliffs in far south-west Victoria and extreme east South Australia, sometimes extending up to 40 km inland along valleys in the Otway Range of Victoria. It requires low dense cover more than 1 m tall, with clear ground beneath to allow easy movement. Again, it favours floristically diverse heaths with shrubs or stunted trees. The recently described subspecies *caryochrous*, in the Otway Range, occurs in open eucalypt forest with dense low understorey, in-

The trio of bristlebirds form a small coherent family that has usually been treated as a subfamily of the thornbills (Acanthizidae). Earlier, very different classifications grouped the bristlebirds with Old World families such as Old World warblers (Sylviidae) or babblers (Timaliidae). Bristlebirds are shy skulkers that frequent dense vegetation. The Rufous Bristlebird mainly inhabits low shrubland and floristically diverse heaths on coastal dunes and cliffs. It needs cover at least 1 m high, but with clear ground below so it can move freely. It is often seen on the edge of its habitat, in more open areas.

[*Dasyornis broadbenti*  
*caryochrous*,  
Wye River,  
Victoria, Australia.

Photo: Graeme Chapman]





cluding tea-trees, sheoaks and sword-sedge. It is found also in densely vegetated gulleys in cool-temperate forest of myrtle beech (*Nothofagus cunninghamii*) and tall mountain ash (*Eucalyptus regnans*) forest. This species frequents the edges of its dense habitat and is often seen in more open areas, such as car parks, tracks and gardens, and blackberry (*Rubus*) patches, being generally the least shy member of the family. Indeed, Rufous Bristlebirds can be observed in richly vegetated gardens in many coastal towns in Victoria. Connectivity between habitat patches may be important locally, and the preserving of gulleys and roadside shelterbelts can assist in maintaining this.

Several thousand kilometres to the west, the subspecies *litoralis* of the Rufous Bristlebird was formerly found in dense impenetrable shrubland on the coastal dunes of extreme south-west West Australia. This very poorly known taxon is now extinct, the overly frequent burning of the habitat being implicated in its loss.

## General Habits

As already noted, bristlebirds are shy and skulking inhabitants of dense vegetation. They creep, mouse-like, through thick vegetation and are usually found by their loud ringing calls. In this comparatively protective habitat, they prefer to run from danger, although they are capable of flying for short distances. Nevertheless, they can be confiding in more open areas, particularly in the early hours of the morning and when undisturbed. When running, they hold the tail horizontally; during foraging, the tail may be slightly raised and fanned, and is often flicked from side to side.

Generally speaking, the behaviour of the dasyornithids is still poorly known, and the exact nature of their social organization remains to be determined. They are often found as pairs, and home ranges may be maintained over several decades, though presumably not by the same individuals.

As far as is known, these are diurnal birds. They seem to be most active during the first three hours after sunrise on clear days and, at the end of the day, in the period from 2–3 hours before sunset to 30 minutes before sunset. Calling by bristlebirds usually ceases about a half-hour before nightfall. Knowledge of their roosting behaviour, however, is almost completely non-existent, beyond the fact that they roost in dense cover.

It is mostly, but not exclusively, the males that sing. They deliver their songs most often in the early morning, generally from logs among dense vegetation, but sometimes from the ground or from the top of a shrub. During singing, the body is held erect, with the head raised and the throat feathers extended, and the tail is cocked to an angle of 45 degrees; the wings may be spread and both the wings and the body shaken during the process. Songs serve an agonistic function, being used to advertise territories or home ranges, as well as to maintain or initiate pair-bonds and to maintain contact between adults; they are also used in defence of the home range. As detailed below (see Voice), all three species are known to perform duetting, but this seems to be more frequent among Rufous Bristlebirds and, to judge from the few reports, least common in the subspecies *monoides* of the Eastern Bristlebird.

The Western Bristlebird has been noted as chasing a group of five Southern Emu-wrens (*Stipiturus malachurus*) from its territory during the breeding season, by flying at them and chasing and harassing for several minutes before they moved off. This bristlebird has been recorded also as giving harsh calls while harassing a tiger snake (*Notechis*) that may have been near the bird's nest. When alarmed, singing Western Bristlebirds dive off their perches and head for deep cover, a response similar to that observed for the Rufous Bristlebird, which runs into cover.

When agitated, Rufous Bristlebirds may raise their crown feathers. This species can be quite pugnacious in defence of its young, having been recorded as spreading the wings and tail and making a close approach to an intruder. One was reported to have pecked the tail of a snake, and others have been seen to take refuge down rabbit burrows when chased. They prefer to run, rather than fly, and they may stretch out the neck and use the



short rounded wings to gain acceleration as an aid in making good their escape.

Very little information is available on the comfort behaviour of this family. Eastern Bristlebirds have been seen to bathe in water, as also has the Rufous Bristlebird, but this appears to be all that is known.

## Voice

All three bristlebird species have loud, melodic, sweet and curiously penetrating songs which carry for long distances, and which serve a territorial function in the breeding season. They quite often vocalize from atop shrubs or logs, which presumably helps to lessen the effect that dense vegetation has in diluting and degrading sound. All bristlebirds are shy and elusive, and are heard far more often than they are seen.

Within the broad song structure there seem to be numerous variations on the theme, which are used when advertising the home range, in disputes over territory and in the maintaining of contact between the pair-members, as well as by the male when attracting a female. If one hears several singing individuals at the same site, this does not necessarily denote the presence of a pair, as some home ranges of the Western Bristlebird have been found to hold more than two mature adults, a fact which can complicate census work. Antiphonal duets are given at the start of the breeding season by both Eastern and Western Bristlebirds, but particularly by the Rufous Bristlebird, and duetting occurs also, rarely, outside this period. These duets are perhaps used in pair formation and as a means of maintaining the pair-bond, or for territorial defence. Song varies among individuals, perhaps being more stereotyped with females, and it is often possible to identify bristlebirds individually by their particular song pattern.

The song of the Eastern Bristlebird is an upslurred and sweet-sounding phrase, with several variants. The typical song of the nominate race consists of three or four repeated notes, such as "teet too whoo-eee" or "chip-cherear-che", terminating with quiet squeaky silvery notes similar to those of a fairy-wren. The same song is often repeated for up to 15 minutes, and song bouts lasting 45 minutes, using three or four song types, have been reported. A complex and seldom heard trilling song during the breeding season, given during chases and in short pair-flights, is perhaps made by the female only. The song of the northern race *monoides* of the Eastern Bristlebird sounds slightly buzzy than that of the nominate race, being a sweet upslurred "chip-choo-twee-tee" and variants, often rapid at the end of the phrase. This

The name "bristlebird" is a reference to the stiff rectal bristles at the base of the bill; their purpose remains unknown. Bristlebirds are medium-sized, dull-plumaged birds with a long, graduated tail that is often held cocked. The short, rounded wings befit sedentary denizens of undergrowth. The bill is long, chunky and pointed, enabling them to ferret about in leaf litter. Typical of a terrestrial species, the legs are strong and enable the bird to run rapidly, as this Rufous Bristlebird conveniently demonstrates.

[*Dasyornis broadbenti* caryochrous, Point Addis Marine National Park, Victoria, Australia. Photo: Peter Fuller]

subspecies is reported to duet less often than the nominate race. Its duets consist of one individual singing and the other replying with a "zit" call or, more rarely, with proper song. The song of the female is sometimes shorter and simpler than that of the male. Song varies among individuals, being perhaps more stereotyped with females. Mimicry is occasionally reported, with the Golden Whistler (*Pachycephala pectoralis*) noted as being imitated.

Western Bristlebirds sing with a sweet, penetrating "chee tiddly-too chip wee too" sequence, with many variations, and deliver also a shorter song phrase of similar quality but softer and throaty. There is some geographical variation in the vocalizations of this species, those in the Fitzgerald River National Park often ending their home-range song with a trill, whereas populations farther west, at Two Peoples Bay, utter only very weak trills, and then only very rarely. Both sexes of this species sing, and duetting is frequent.

The Rufous Bristlebird's penetrating "cheep-cheep-chew-chew-ee-e" song has a squeaky and rather grating quality, some phrases sounding not unlike the noise made by a squeaky wheel. Partners regularly indulge in melodious antiphonal duets, much more so than is the case with the Eastern Bristlebird. One such duet has been transcribed as "bet-tip, bet-tip, bet-tip, seeee-churcher-wee", with "cher wee" given by the second individual at the same time as the "er-wee" of the first bird, so that the whole sometimes sounds as if it is given by a single individual. During the breeding season, this species responds to playback of taped recordings of its song. The extinct race *litoralis* of the Rufous Bristlebird was reported to have a distinct song, but details of this are, unfortunately, lacking.

Other vocalizations made by this family are unspectacular. Eastern Bristlebirds emit raspy, incisive "zit" notes and similar raspy "chit" or "chip" sounds, which are repeated as a continuous quiet chatter by the pair when foraging. The alarm call of both races of this species is a loud "zit" or "zeet", sometimes repeated three or four times, and this is often given when people enter a pair's territory; it is given also by the female in response to her mate's song and as a contact note when feeding. Another call, "zeeat", seems to indicate surprise, and is uttered by the bristlebird when it is disturbed in the open. This species occasionally utters a low "tuck tuck", delivered while the head is

thrown back. Nestlings emit loud begging calls when the parents approach. The calls of the two other species are similar. For example, Western Bristlebirds maintain contact during foraging with soft "chit" or "zit" calls. The Rufous Bristlebird utters loud staccato "twik" or "tweek" calls as alarm notes, and a soft "zit".

### Food and Feeding

The three members of this family are primarily consumers of invertebrates and seeds, usually foraging singly or in pairs in dense vegetation, with the tail held horizontally or slightly raised and fanned, and constantly flicked from side to side. They generally skulk in or beneath dense cover, but are sometimes seen in the open if undisturbed. Pair-members keep contact with each other by uttering soft calls at regular intervals.

Most of the foraging undertaken by bristlebirds is carried out on or near the ground, where the birds search in leaf litter, on open ground or in foliage, probing with the stout pointed bill and sweeping it from side to side, moving leaves aside. They seem not to employ the feet for scratching or scraping, preferring instead to peck at the ground or to probe with the bill with quick jerky movements, while turning the bill from side to side. Bristlebirds move slowly through the vegetation, walking or hopping slowly, and gleaning from foliage. They make occasional dashes for short distances of about 50 cm.

Reported food items include a wide variety of seeds, among them those of the family Poaceae and of the genera *Carex*, *Banksia*, *Lycium*, *Centaurea*, *Sonchus* and *Acacia*, as well as fruits and seeds of assorted chenopods. Other fruits taken are those of ericaceous plants and of *Exocarpus* and *Lycium* species. A great variety of arthropods is also taken, including cockroaches (Blattodea), larval and adult beetles (Coleoptera), flies (Diptera), cicadas (Cicadidae), myrmicine ants and other hymenopterans, lepidopteran caterpillars and orthopterans, and also spiders (Araneae) and annelid worms. Rufous Bristlebirds have been observed to profit from food scraps deposited around car parks by humans. The Eastern Bristlebird has been seen to take nectar from the flowers of heath banksia (*Banksia ericifolia*), and both this species and the Rufous Bristlebird have been watched while

When a bristlebird sings, it holds the body erect, with the head raised and throat puffed out, and the body vibrating. To make itself look even bigger, a bird may cock its tail at about 45° and spread its wings. Bristlebird songs are loud, melodic and far-carrying. The basic refrain of the Eastern Bristlebird is a sweet, upslurred phrase, with several variants depending on the purpose. This species may sing for as much as three-quarters of an hour, with individual song bouts lasting up to 15 minutes. There is individual variation among songs, particularly in males. Some birds mimic other species, such as the Golden Whistler (*Pachycephala pectoralis*).

[*Dasyornis brachypterus monoides*,  
Bristlebird Creek,  
Sarabah Range,  
Queensland, Australia.  
Photo: Graeme Chapman]







Living in dense vegetation can make it hard to make yourself heard, so bristlebirds tend to emerge from cover to sing from prominent songposts. Suitable perches include logs and the tops of shrubs, or, as in the case of this **Rufous Bristlebird**, a bare tree. This species' song is penetrating, melodious and liquid, and contains some rather grating elements that recall a squeaky wheel. Pairs regularly engage in antiphonal duets at the start of the breeding season. These appear to help with the formation and maintenance of the pair, but may also assist in territorial defence.

[*Dasyornis broadbenti caryochrous*, Loch Ard Gorge, Port Campbell National Park, SW Victoria, Australia.

Photo: Hans & Judy Beste/Lochman Transparencies]

they fed on insects on sandy beaches. All three species occasionally swallow grit as an aid to digestion.

There appear to be no records of any of the dasyornithid species drinking water. It is probable that the diet, consisting of arthropods and seeds, supplies all of the moisture required by these birds.

## Breeding

The reproductive behaviour of the Dasyornithidae is rather poorly known, with relatively few nests found in recent times. All three species are likely to form permanent pairs, but this probability requires proper confirmation. Although Western Bristlebirds appear sometimes to occur as simple pairs, at other times more than two "adults" are found interacting as a single social unit, apparently in a single home range.

Bristlebirds are territorial in the breeding season, defending a core area of the home range, and they may maintain a home range but not an exclusive territory when non-breeding. During a study of the Western Bristlebird, the home ranges of pairs overlapped and there was no evidence of individuals or pairs occupying exclusive territories during the non-breeding season. Home ranges may be maintained over long periods, as demonstrated in Western Australia, where there was little change over 30 years in the range boundaries among Western Bristlebirds at Two Peoples Bay. In radio-tracking studies of this species, the home range of one bird was 6 ha and that of another was 21 ha. It is likely that home-range size may vary with habitat, although this has not yet been proven. In the case of Eastern Bristlebirds, it has been suggested that territories of the northern population are smaller than those in the south, which might be a function of different habitat type.

In the west, the Western Bristlebird breeds during July–October, although nesting by this species has been recorded also in November. The two species confined to eastern Australia breed between August and February. All three bristlebirds are single-brooded. Claims that the Rufous Bristlebird may sometimes be double-brooded are perhaps the result of confusion over replacement clutches, as both Eastern and Rufous Bristlebirds will relay if the first clutch is lost. This is an important factor in the

captive-breeding initiative for the former species (see Status and Conservation).

Nests of all three bristlebirds are sited in low dense vegetation. The nest structure is large, with an ovoid or spheroid shape, and domed, with a side entrance near the top. It is loosely constructed from such material as coarse grass stalks, rushes, twigs, sedges, reeds and strips of bark, sometimes with leaves incorporated in the base, and is lined with softer fine, dry grass or sedge, although some Western Bristlebird nests are unlined. The nest of the Rufous Bristlebird is larger than those of the other bristlebirds, and resembles a rugby football laid on its side, with a side entrance near the top and, sometimes, a broad platform of sedge leaves built at the entrance. The female of this species may build the nest alone, the time taken in its construction reported as being 2–3 days.

Bristlebird eggs are dull-coloured with numerous dark spots and blotches, particularly at the larger end. The clutch consists almost always of two eggs, with rare old and unsubstantiated reports of three-egg clutches for the Eastern Bristlebird. In many cases, however, only one egg hatches. In this connection, it is interesting that there are claims in the older literature that one egg is often infertile, and addled eggs were quite often noted in nests of the Rufous Bristlebird in the past.

It is likely that only the female incubates, but this has not been verified. Both sexes appear to feed the young, which stay with the adults for a while after fledging. The incubation period of the Eastern Bristlebird is at least three weeks, and its nestling period is at least eleven days, but both are very little known. The Rufous Bristlebird's incubation period is of similar duration, at 16–21 days, but this species has a longer nestling period, lasting for 18–21 days. Details of the corresponding aspects of the breeding biology of the Western Bristlebird are completely unknown.

Only the Rufous Bristlebird has been recorded as being parasitized by any of the cuckoos, in this case by the Fan-tailed Cuckoo (*Cacomantis flabelliformis*). All bristlebirds, however, are very prone to desertion of the nest, and this could be a factor in the population declines, especially if disturbance has increased.

Little is known about the longevity of dasyornithids. In ringing studies, Rufous Bristlebirds have reached 3 years between the date of ringing and the date of the final sighting, and an Eastern Bristlebird was recovered after 4 years and 9 months.



### Movements

Unsurprisingly, the dasyornithids, with their relatively weak powers of flight, are sedentary throughout their fragmented ranges. They have been recorded as moving distances of a few hundred metres, probably within the home range. A pair of Western Bristlebirds was able to colonize a site some 2.5 km from the species' nearest population, but for all three bristlebirds the movements are very limited in extent.

### Relationship with Man

Being very shy and retiring, rare, relict species, bristlebirds do not figure large in local folklore. Their relationships with man have been somewhat one-sided, limited almost solely to human destruction of much of the birds' habitat. Happily now, there are several state and federal conservation initiatives, aimed at helping to manage the species for the future. Bristlebirds are among the flagship species for conservation, and they have attracted dedicated workers and researchers, determined to help to safeguard them for future generations.

Taxonomists, too, must have a special relationship with the bristlebirds, with varying viewpoints over how best to treat them over the years. The growing numbers of keen birdwatchers who collect lists of the bird families that they have seen will also now be paying much more attention to the bristlebirds, following their elevation to the taxonomic status of a family.

Each of the three species of bristlebird can be seen in car parks or near picnic sites. Despite their normally very skulking habits, these birds seem to be attracted to such man-made sites when they are adjacent to bristlebird habitat. Indeed, many birders have seen their first Western Bristlebirds in a car park at Two Peoples Bay, and in south-east Australia the Rufous Bristlebird likewise may be seen at several such sites along the Great Ocean Road, in Victoria. The distinctive loud songs of dasyornithids always provide an aesthetic pleasure to the human ear, and for this reason, coupled with their rarity, they are generally welcomed by humans.

### Status and Conservation

Of the three species of bristlebird, two are almost entirely management-dependent within national parks and reserves. Habitat destruction has had a dire effect on all members of this family. All three are particularly vulnerable to fire damage, and the increased burning and drainage associated with land settlement has caused range contractions. In some areas, where regular burning occurs on a short cycle of 5–10 years or less, the vegetation does not have time to recover properly, thus resulting in local extinctions. In areas of infrequent burning, bird populations are able to move to a nearby unburnt area where they can survive until the vegetation in their former home has recovered sufficiently for them to return, but large-scale unchecked bush fires remain a serious danger. Although there may be some recolonization after burning if nearby refugia survive the fires, bristlebirds appear to be such poor dispersers that some areas are never recolonized. A "correct" fire regime, as well as fire control, is essential for bristlebirds, all of which are highly sedentary, with poor flying abilities, preferring to run rather than to fly, which makes them even more vulnerable to fire. Recent research suggests that the avoiding of fires in the habitat may well be an effective management tool for the Western and Rufous Bristlebirds, but that the third species, the Eastern Bristlebird, needs the appropriate fire regime to promote the grassy, more open habitat that it favours.

Many previous management assumptions about the role of fire in maintaining optimum habitat for Western and Rufous Bristlebirds seem to be erroneous. Should a fire be too severe, it destroys both the habitat and potential refugia, as well as the birds themselves, with localized extermination a consequence. Recolonization of an area is, therefore, unlikely unless some individuals manage to survive in areas very close by. Fires can physically destroy remnant populations, with survivors unable to disperse back through unsuitable habitat. It was often thought that too long a period without burning could result in a vegetation structure too dense for bristlebirds. Conversely, it is also argued that fires may not, after all, be required for the control of such habitats so far as the Western and Rufous Bristlebirds are

*As might be expected for such a homogeneous group, the three bristlebirds forage in similar manner. Pairs or single birds feed jerkily on or just above the ground, probing open ground, sweeping leaf litter aside, and gleaning from foliage. Most of the time, bristlebirds walk or hop sedately beneath or through dense vegetation, making occasional short dashes. Bristlebirds eat seeds and fruit, but also arthropods, such as beetles, cockroaches, spiders and, as with these Rufous Bristlebirds, earthworms. Although somewhat retiring, this species is the least shy of its family and will sometimes feed out in the open if undisturbed.*

[*Dasyornis broadbenti caryochrous*, Loch Ard Gorge, Port Campbell National Park, SW Victoria, Australia.

Photo: Hans & Judy Beste/  
Lochman Transparencies]





concerned. Since bristlebirds live at high densities in some long-unburnt areas, and as they require dense habitat, fires seem much more of a hazard than a benefit. A mosaic of habitats may be desirable, with the recently burnt ones less favourable but supporting an increasing density of bristlebirds as the habitat recovers. When the leaf litter is burnt, it is some time before adequate populations of invertebrates are built up again.

In attempts to establish satellite populations, translocation work has been initiated for both Eastern and Western Bristlebirds, with an unsuccessful first attempt for the latter but more promising results for the former. Most populations of these two species are in national parks and reserves, where active management programmes are in place for all the rare endemic bird species. Bristlebirds will always remain vulnerable to bush fires, particularly after a series of dry years.

Two members of the family are globally threatened. The Western Bristlebird has the most restricted distribution of the family, and is classified as Vulnerable. It was formerly listed as Endangered, but this assessment was revised in 1994, when successful habitat management led to a build-up of numbers within reserves. The total population in 2000 was estimated at between 1300 and 2000 breeding adults, in six subpopulations. There are at least 125 pairs in the Fitzgerald River National Park, but not all suitable habitat in the park has been surveyed. In 2001, there were 509 individuals giving calls indicative of home-range possession in the Two Peoples Bay–Mount Manypeaks area, but by 2006 this figure had declined to 202, owing largely to a series of extensive wildfires.

The most seriously threatened of the three bristlebird species, however, is the Eastern Bristlebird, which is placed in the conservation category of Endangered. The northern subspecies, *monoides*, has been listed regionally as "Critically Endangered". This subspecies has a population estimated at fewer than 50 individuals, fragmented between the Conondales, in south-east Queensland, and Tweed Heads, in north-east New South Wales, with unsuitable farmland in the intervening area. It has declined sharply around Lamington National Park and has disappeared from many of its former haunts, owing principally to the effects of wildfires, a situation exacerbated by drought conditions. The isolated northernmost population in the Conondale Range, 150

km north of Brisbane, was recorded in fieldwork for the Atlas project, during 1998–2002, but it must be very small, and in 2007 was thought to consist of just a single pair. Restoration work on the habitat there is aimed at controlling invasive exotic weeds which compete with native sorghum, a favoured nesting habitat. The southern, nominate race of the Eastern Bristlebird has a population estimated at fewer than 1550 individuals in New South Wales as far south as Jervis Bay, and 220 in the south-east of that state and adjacent east Victoria. In New South Wales, it was common around Sydney up to the early twentieth century, and formerly occurred near Lismore, Gosford, Dorrigo and Wootton. The species was known from ten sites in Victoria in 1978–1985, but by the late 1990s it was recorded at only one.

A captive-breeding initiative is under way on the Gold Coast, in south-east Queensland. This involves the removing of eggs from wild pairs, which will lay again if conditions are suitable. One captive pair has successfully raised its own youngster, and the aim is to breed twenty in captivity before any releases commence. Queensland Parks and Wildlife Service has an Eastern Bristlebird Recovery Programme, complete with a well-qualified co-ordinator, and publishes *Bristlebird Bulletin*, which gives updates on the work being undertaken. Some hope remains for the northern subspecies, therefore, so long as long-term conservation initiatives are kept up.

Eastern Bristlebirds were thought never to have been common, even before European settlement. Widespread land clearance as the Australian continent was settled by Europeans led to the isolation of small populations, and bush fires have compounded this fragmentation, with local extinctions after bad fires. In addition, grazing by livestock may permit invasion by exotic weeds and undermine the integrity or suitability of the habitat. Some aggressively colonizing exotics may well be an insidious long-term and as yet unquantified threat. Otherwise, predation by rats (*Rattus*) and cats and mortality from roadkill have a relatively minor effect on the population, but these factors may play a more important role as the population declines and becomes more vulnerable.

Given the extreme rarity of this species, and its northern race in particular, a fire during the breeding season, in July to October, would be devastating, and it is crucial that the fire regime instigated is the correct one. In 1991, for example, a fire at one



As is not unexpected for localized, rare and skulking species, the breeding biology of the three bristlebirds is poorly known. Their nests are all rather similar, being large, spherical and domed, with a side entrance. Constructed from twigs, sedges and strips of bark, they are mostly lined with finer grass and are sited just above the ground in dense cover. Bristlebirds are single-brooded, but may relay if the clutch is lost. Clutch size is almost always two. The **Eastern Bristlebird** incubates for at least three weeks. Its nestlings are fed by both parents for about 11 days until fledging, and for a while thereafter.

[*Dasyornis brachypterus*, Australia.  
Photo: E. McNamara/  
Ardea]

All three bristlebirds are restricted-range species and are highly localized. Two species, the Eastern Bristlebird (*Dasyornis brachypterus*) and the Western Bristlebird, are globally threatened.

The latter is classed as Vulnerable, with its population currently stable at 1500–2000 individuals. This species is particularly susceptible to habitat destruction or alteration.

Wildfire is the prime concern, leading to local extinctions because the poor-flying bristlebirds can neither disperse to escape the fire nor return from nearby sites to recolonize regenerated habitat.

[*Dasyornis longirostris*,  
Two Peoples Bay,  
Western Australia,  
Australia.

Photo: Graeme Chapman]



key site destroyed over 70 individuals of *monoides*, which is possibly more than the number of this race that now exist, which illustrates very well the magnitude of the threat. During fires, adults can take refuge in the nearby rainforest, although eggs and nestlings may, of course, be destroyed. Grassy habitats seem to regenerate quickly, although the much-favoured wild sorghum clumps take much longer to recover and the absence of these may adversely affect habitat suitability and breeding success. Much study has been devoted to determining the most appropriate management regime for the species, and this research has been combined with liaison work with the local human community. It is now believed that a balance between the grazing of beef cattle and the maintaining of good habitat for the Eastern Bristlebird is achievable, given the judicious use of controlled burning at the proper time.

Compared with its two congeners, the Rufous Bristlebird is in rather a better position in terms of its conservation status, although one of its three subspecies, the geographically isolated *litoralis*, is believed to be extinct. This race was last recorded in its western homeland during 1906–1908, not long after its original discovery, but there are several unconfirmed reports from the years 1940, 1977 and 1980. The subspecies *caryochrous*, found in the Otway Peninsula, in coastal west Victoria, has a population estimated at well above 4000 and perhaps in excess of 10,000 individuals. The recently expanded Otway National Park should help to secure the habitat for this taxon, assuming that suitable management is carried out. The nominate race has an even larger population, totalling approximately 17,800 individuals in South Australia. The largest population here, in the Coorong, is thought to be stable; comparison of the figures produced during work for the two Australian Bird Atlases, one in 1977–1981 and the second in 1998–2001, reveals that the reporting rates in the core bioregion for this subspecies, the Naracoorte coastal plain, were almost identical. This race extends into extreme south-west Victoria, where the reporting rate is similarly constant, with no apparent change in the area of occupation or the extent of occurrence.

The Rufous Bristlebird was probably already limited to a narrow linear, discontinuous distribution at the time of European settlement. Subsequent land clearance for agriculture, grazing and settlement has led to the extinction of one subspecies and the decline of the others. The species remains vulnerable to further habitat fragmentation and invasion by exotic species, which may unfavourably alter the habitat composition. Overgrazing by rab-

bits (*Oryctolagus*) can damage the habitat, and the bristlebird is potentially vulnerable to predation by foxes (*Vulpes*) and cats. In the more urbanized areas, it may suffer adverse effects of off-road driving in the sand dunes by dune buggies, motorbikes and four-wheel-drive vehicles. The species readily deserts its nest, which is perhaps a factor in its decline if disturbance has increased. Controlled annual burning can be a problem, even if rigorously supervised, as is the maintenance of firebreaks and the slashing of heathland and roadside vegetation for highway maintenance. Constant creeping suburbanization, aggravated by the recent housing boom, is a further potential threat, causing continued habitat fragmentation and degradation.

Tea-tree thickets represent a significant habitat for Rufous Bristlebirds, and can be particularly important along roadsides where remnants of intact vegetation exist. Such areas provide valuable links between habitat areas, and permit connectivity within the population. In a local initiative around Port Campbell, in Victoria, Rufous Bristlebirds have been able to utilize new areas of habitat created by the direct seeding of tea-trees and other suitable species along unused roads, and shelter-belts 20 m wide linking known habitat areas.

Considerable habitat for this species now lies within national parks and other protected areas, but fires remain a constant threat. Nevertheless, the Rufous Bristlebird is still quite widespread in two core areas, and, with continued adequate management, the prospects for its long-term survival are reasonably good.

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PLATE 44

inches 4  
cm 10

## PLATE 44

## Family DASYORNITHIDAE (BRISTLEBIRDS) SPECIES ACCOUNTS

### Genus *DASYORNIS* Vigors & Horsfield, 1827

#### 1. Eastern Bristlebird

##### *Dasyornis brachypterus*

French: Dasyorne brun German: Braunkopf-Lackvogel Spanish: Picocerdas Oriental  
Other common names: Bristlebird, Brown/Common Bristlebird

**Taxonomy.** *Turdus brachypterus* Latham, 1801, near Port Jackson, New South Wales, Australia. In past, sometimes treated as conspecific with *D. longirostris*, but differs significantly in plumage and voice. Two subspecies recognized.

##### **Subspecies and Distribution.**

*D. b. monoides* Schodde & Mason, 1999 – coastal and subcoastal E Australia from SE Queensland (Conondale Range) S to NE New South Wales (S to Dorrigo Plateau).

*D. b. brachypterus* (Latham, 1801) – coastal SE Australia from Illawarra (SE New South Wales) S to Mallacoota (E Victoria).



**Descriptive notes.** 18–21 cm; 35–50 g. Typical bristlebird with short, rounded wings, long graduated tail often ragged and with rounded tip, and slightly decurved bill. Nominate race has pale lores and short pale supercilium to just behind eye, narrow off-white eyering (most marked behind eye); rest of head, side of neck and upperparts dark olive-brown, merging into rich rufous-brown on rump and uppertail-coverts; ear-coverts finely streaked white, crown sometimes flecked with pale grey; rufous-brown or pale chestnut wash on upperwing; uppertail dull rufous-brown; chin, malar area and throat off-white; underparts pale grey to

brown, darker on breast side, warmer on flanks and undertail-coverts, centre of belly off-white, breast with indistinct large grey spots or scallops and dark brown mottling; underwing brownish-grey; iris red to red-brown; bill dark brown with horn-coloured base of lower mandible, or upper mandible pale and cutting edge and lower mandible pinkish-white, usually with greyish tip, gape off-white to pinkish-white; legs grey-brown or pinkish-brown. Differs from *D. longirostris* in slightly larger size, less distinctly mottled and scalloped plumage. Sexes alike in plumage, but female smaller. Juvenile very similar to adult, and best told by pale brown or brown iris, yellow gape, warmer brown hindneck and breast, slightly darker ear-coverts. Race *monoides* is very similar to nominate, but somewhat darker both above and below, breast side to flanks olive-brown with little or no scalloping, belly centre whiter, lower flanks dark brown. **VOICE.** Song loud, melodic, sweet and far-carrying (c. 400 m), given mainly in breeding season (least often in Mar–Jun), four types of song bout, using similarly structured songs, have territorial function or serve to attract female; antiphonal duets at start of breeding season (and rarely when not breeding), perhaps used in maintaining pair-bond or for territorial defence. Same song often repeated for up to 15 minutes, and some bouts of singing lasting 45 minutes using three or four song types. Also, complex trilling song in breeding season when chasing and making short pair-flights, seldom heard (perhaps made by female only). Typical song of nominate race an upslurred and sweet “chip-choo-wee-wee” and variants, with quiet squeaky notes at end, and also raspy, incisive “zit” notes. Race *monoides* song perhaps slightly buzzy than nominate race and rapid at end of phrase, but variable: song of female (given less often) sometimes shorter and simpler than that of male, song varies individually, perhaps more stereotyped among females; reportedly duets less often than nominate, duet may be one bird singing and the other replying with “zit” call. Occasional mimicry reported, with Golden Whistler (*Pachycephala pectoralis*) imitated. Calls include repeated raspy “chrr” or “chrrp”, also as continu-

ous quiet chatter when foraging; low “tuck tuck”; loud, sometimes repeated “zit” or “zeet” as alarm (often when people enter territory), given also by female in response to male’s song and as contact when feeding; “zeet” seems to indicate surprise when disturbed in open; nestlings give loud begging calls when parents approach.

**Habitat.** Wide range of habitats, including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest; prefers dense floristically diverse formations and occurs in understorey under trees or shrubs. N race (*monoides*) usually in open forest with dense grassy understorey, particularly in ecotone near rainforest; ground layer usually 95–145 cm tall, with dense tussocks of wild sorghum (*Sorghum leiocladum*), blady grass (*Imperata cylindrica*), snow grass (*Poa sieberiana*), kangaroo grass (*Themeda triandra*), and shrubs; also in grass-tree (*Xanthorrhoea*) plains. S race (nominate) mainly in heathland, sedgeland, shrubland or thickets adjacent to woodland; fond of riparian habitats with paperbarks (*Melaleuca*) and tussock-sedges, and occurs in open sclerophyll woodland or forest dominated by eucalypts (*Eucalyptus*) and banksias with shrubby understorey less than 3 m tall, and thick ground cover of grass and bracken (*Pteridium*); shrubby heathland and sedgelands usually less than 2 m tall and including swamp-heath (*Sprengelia incarnata*), heath banksia (*Banksia ericifolia*), swamp sheoak (*Allocasuarina paludosa*), grass-trees and species of *Hakea*.

**Food and Feeding.** Invertebrates and seeds, rarely nectar. Reported items include seeds of family Poaceae and of plant genera *Carex*, *Banksia*, *Lyctum* and *Acacia*; insects, including cockroaches (Blattodea), beetle larvae and adults (Coleoptera), flies (Diptera), cicadas (Cicadidae), myrmicine ants and other hymenopterans, lepidopteran caterpillars, and orthopterans; also spiders (Araneae) and annelid worms; seen to take nectar from flowers of heath banksia. Forages singly or in pairs; partners close together in breeding season, often separate at other times. Forages in dense vegetation, sometimes in the open if undisturbed; seen to feed among seaweed on seashore boulders. Walks or hops slowly through vegetation, making occasional dashes for short distances. Seeks food on or near the ground, in leaf litter, on open ground or in foliage. Pecks at ground; probes with stout bill and sweeps it from side to side, moving leaves; occasionally gleans from foliage or makes aerial sallies.

**Breeding.** Season Aug–Feb; single-brooded. Probably pairs for life. Nest large, domed, ovoid or spheroid, with side entrance near top, loosely built from coarse and stiff grass stalks, sedges or reeds, or strips of bark, sometimes with leaves in base, lined with softer fine, dry grass or sedge, placed low down (usually at 14–45 cm) in centre or near base of sedges, grasses, ferns or shrubs (wild sorghum much favoured); territory variable, c. 2 ha to 4.06 ha, size likely dependent on habitat, and suggested that territories of N population smaller than those in S. Clutch 2 eggs (occasional reports of 3), dull pale brown to sometimes almost white, with numerous purplish-brown to reddish spots and blotches, particularly at larger end, 26.5 × 19.7 mm; if clutch lost, replacement often laid; incubation probably by female alone, period at least 3 weeks; chicks apparently fed by both parents, nestling period at least 11 days. Often only one egg hatches, and sometimes evidently only one egg fertile; readily deserts nest if disturbed. Longevity in ringing studies at least 4–1 years. **Movements.** Generally sedentary. Some local movements to recolonize areas after fire, probably mainly on foot (powers of flight weak); recorded as crossing major roads across more than 100 m of open space, and running along tracks for more than 150 m. Six recoveries of three individuals all within 10 km of ringing site.

**Status and Conservation.** ENDANGERED. Restricted-range species; present in Eastern Australia IBA. Fragmented range, within which probably fewer than 2000 individuals remain, in isolated populations; some populations on brink of extinction. Though never to have been common, even before European settlement. Widespread land clearance for settlement and agriculture led to isolation of small populations, and bush fires have compounded this problem, causing some local extinctions. Although some recolonization after burning, appears to be a poor disperser and some areas never recolonized. N race *monoides* listed as “Critically Endangered” in Australia, with estimated population of fewer than 50 birds fragmented between Conondales (SE Queensland) and Tweed Heads in (NE New South Wales); has declined sharply around Lamington National Park and gone from many former haunts, owing mainly to wildfires, effects of which exacerbated by drought conditions. Isolated population in Conondale Range (150 km N of Brisbane) very small, maybe only a single pair, and restoration work there aimed at controlling invasive exotic weeds, which compete with native sorghum (favoured nesting habitat); largest known colony, near



Cunningham's Gap (between Warwick and Ipswich, in Queensland), wiped out in 1991 by a fire (thought to have been started by a cigarette end), believed responsible for deaths of 76 birds, and replacing of colony could, in view of species' slow reproductive rate, take 70–80 years. Captive-breeding programme underway on Gold Coast of SE Queensland, based on removing of eggs from wild pairs and incubating these artificially. fledglings then hand-reared and released into purpose-built aviaries to form nucleus of captive breeding stock, with eventual aim of releasing birds in wild in suitable habitat where threats minimized; one captive pair has successfully raised its own youngster, and plan is to breed 20 individuals in captivity before releases commence. Queensland Parks and Wildlife Service has an Eastern Bristlebird Recovery Programme, so some hope remains for *monoides*. Nominate race, in S. estimated at fewer than 1550 individuals in New South Wales as far as Jervis Bay, and 220 in SE New South Wales and E Victoria; was common around Sydney until early 20th century, and formerly occurred near Lismore, Gosford, Dorrigo and Wootton; known from ten sites in Victoria in 1978–1985, but recorded from only one in late 1990s. Reintroduction initiative involving relocating of bristlebirds in Jervis Bay region (from Bherwerre Peninsula to Beecroft Peninsula); 50 individuals released in Beecroft during 2003–2005, and breeding now recorded; in source population (in Bherwerre Peninsula), removals had no significant impact in local population. Population estimates in New South Wales in 2007: Barren Grounds 560, Budderoo 250, Jervis Bay 800, Nadgee 300, Beecroft (introduced) c. 30. Correct fire regime imperative for this species, as bad bush fires destroy birds, habitat and refugia; recent research suggests that avoiding fires in the habitat is an effective conservation tool. Grazing can allow invasion by exotic weeds and may undermine integrity/suitability of habitat, and some exotic plants may be a long-term insidious threat. Predation by rats (*Rattus*) and cats and deaths from road traffic have relatively minor effect on population, but may play a more important role in general population decline as numbers decrease; possibly vulnerable to human disturbance, particularly when nesting, but much of habitat too dense to permit easy access.

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## 2. Western Bristlebird

*Dasyornis longirostris*

French: Dasyorne à long bec

Spanish: Picocerdas Occidental

German: Langschnabel-Lackvogel

Other common names: Long-billed/Brown/Western Australian Bristlebird

**Taxonomy.** *Dasyornis longirostris* Gould, 1841, Swan River = King George Sound, Western Australia.

In past, sometimes treated as conspecific with *D. brachypterus*, but differs significantly in plumage and voice. Monotypic.

**Distribution.** Coastal SW Western Australia between Two Peoples Bay and Waychinicup, and in Fitzgerald River National Park. Small translocated population near Walpole (W of Albany) may now be extinct.

**Descriptive notes.** c. 17 cm; 26–39 g. The smallest bristlebird; stout body, short rounded wings, longish graduated and often ragged tail, and medium-length slightly decurved sturdy bill. Has lores, malar area and diffuse supercilium off-white to grey-white with faint dark flecking, eyering off-white (more obvious behind eye), ear-coverts light brown with fine whitish streaking; top of head dark brown with pale mottling, upperparts dark brown, with more extensive large pale mottles obvious on mantle, merging to rufous-washed dark brown lower back and rump, and rufous-brown uppertail-coverts, upperwing rufous-brown,



remiges dark-tipped and tertials dark-centred; uppertail olive-brown, rectrices with rufous margins; neck side grey-brown with dark brown scalloping; breast light brownish-grey, warmer brown at side, and finely scalloped dark, centre of belly off-white, shading to warm brown on flanks and side of belly, all finely scalloped dark brown; underwing brownish-grey; iris brick-red or red-brown; bill dark grey, creamy-pink base of lower mandible, cream or pale grey gape; legs grey or dirty pink. Sexes similar. Juvenile is similar to adult, but lacks mottling on upperparts and scalloping on underparts. Voice. Vocalizations loud and distinctive, throughout year, less frequent over summer and most intense in winter and spring. Song, usually from dense cover but at times from shrub top, a sweet, penetrating "chee tiddy-too chip wee too" series with many variations, also a softer throaty song phrase of shorter duration; song apparently to maintain contact between pair or group-members, and advertises home range, with one song type used in territorial disputes; both sexes sing, and duetting frequent. Varies geographically: in Fitzgerald River National Park home-range calls often end with trill, whereas at Two Peoples Bay only very weak trill heard and then only very rarely. During foraging soft "chit" or "zit" calls as contact.

**Habitat.** Dense closed coastal heathland, and more open heath where dense clumps or thickets present. Heath is floristically diverse and 0.5–1.5 m tall, with species of *Banksia* (including *B. bancroftii*, *B. coccinea*, *B. dryandra* and *B. attenuata*), paperbarks (*Melaleuca*), *Haakea* species, tea-trees (*Leptospermum*), *Dryandra*, dwarf sheoak (*Allocasuarina humilis*), basket-flower (*Acaemanthus*) and *Lambertia*, often with abundant sedges such as *Gahnia*, *Cyathochaeta*, *Lepidosperma* and sword-sedge (*Anarthria*) growing between shrubs, also with grass-trees (*Xanthorrhoea*). Several species of dwarf eucalypt (*Eucalyptus*) may grow as emergents, including mallee, dwarf jarrah and marri 2–4 m tall. Sometimes found in heathland below eucalypt stands, also along densely vegetated drainage lines in more open heath.

**Food and Feeding.** Invertebrates and seeds, but few detailed data. Seeds include those of *Anarthria scabra*, *Daviesia* and *Acacia*; invertebrates include beetle larvae and adults (Coleoptera), hymenopterans and orthopterans, also earthworms (Oligochaeta) and snails (Gastropoda). Forages usually singly or in pairs in dense vegetation, sometimes in the open if undisturbed, or hops slowly through vegetation, gleaming from foliage, makes occasional short dashes for distances of c. 50 cm. Feeds on or near ground, among leaf litter, on open ground or from foliage. Active, pecking

at ground or probing with bill with quick jerky movements, pivoting on feet as it turns from side to side; sweeps aside leaves by moving bill from side to side.

**Breeding.** Poorly known, and few records. Season Jul–Oct/Nov; single-brooded. Possibly pairs for life, partners spending much time together, but confirmation required. Territory occupied all year. Large nest domed or globular, with large entrance hole on side near top, loosely built from rushes and sedges, as well as twigs and coarse grass stalks, unlined or with soft fibre lining, for four nests average length 12 cm, width 10 cm and height 12 cm; placed 10–60 cm above ground and well hidden among or under overhanging vegetation, usually in sedge clump, sometimes in shrub (e.g. *Banksia*) or in vines; home range c. 6–8 ha, with pair spending much time in core area (presumably territory) of 1–3 ha. Clutch almost always 2 eggs, dull pale brown, sometimes almost white, with numerous purplish-brown to reddish spots and blotches, particularly at larger end, 24 × 18.6 mm; no information on incubation and nesting periods; young stays with adults after fledging, may be independent by Jan. Normally only one egg hatches; claimed that sometimes only one of the eggs is fertile.

**Movements.** Sedentary; some local movement, especially after bush fires. One pair colonized a site at Two Peoples Bay more than 2.5 km from nearest population. One ringing recovery was within the individual's home range.

**Status and Conservation.** VULNERABLE. CITES I. Restricted-range species: present in South-west Australia EPA. Formerly categorized as Endangered. After its initial discovery on Swan R. near Perth, in 1839, was found there again in 1880s, and small colony was located near Wilson's Inlet in 1907 but seemingly destroyed by fire in 1914; species then disappeared until 1945, when discovered at Two Peoples Bay in what is still the heartland. Total population in 2000 estimated at 1300–2000 breeding birds, in six subpopulations; largest is of c. 1000 individuals between Two Peoples Bay and Waychinicup, with c. 300 in Fitzgerald River National Park. Density estimated at c. 0.1–0.3 birds/ha in good habitat; 12 pairs in c. 80 ha at Mt Gardner. At least 125 pairs present in Fitzgerald River National Park, but not all suitable habitat in the park has been surveyed. In 2001 there were 509 individuals giving home-range type of calls in Two Peoples Bay–Mt Many Peaks area, but by 2006 this had declined to 202, largely as a result of a series of extensive wildfires (number of birds giving home-range call type is an index of number of pairs, but accuracy of method not known). Habitat destruction has had dire effect on this species and its congeners. Particularly vulnerable to fire damage; increased burning and drainage associated with land settlement have caused range contractions. In some areas where regular burning occurs at intervals of less than 5–10 years, allowing insufficient time for vegetation to recover, there have been local extinctions. In areas of infrequent burning, populations are able to move to nearby unburnt area, but large-scale unchecked bush fires remain a serious danger. May be vulnerable to human disturbance when nesting, but much of its habitat is, fortunately, too dense to permit easy access. Heath clearance and swamp drainage were threats during early years of settlement, but have now largely ceased. In attempts to establish satellite populations, translocation work was initiated, with eight individuals from Two Peoples Bay transferred to Walpole–Nornalup National Park (W of Albany) in 1999, and a further seven in spring 2000; although area was burnt in bush fires in 2001 at least seven birds survived, but only one located by 2003. At least one other apparently suitable translocation site exists in Walpole area, and there are plans to carry out a further translocation, possibly in 2007.

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## 3. Rufous Bristlebird

*Dasyornis broadbenti*

French: Dasyorne roux

German: Rotkopf-Lackvogel

Spanish: Picocerdas Rufo

Other common names: Lesser Rufous/Rufous-backed/Southern Bristlebird, Cartwheel-bird

**Taxonomy.** *Sphenura Broadbenti* McCoy, 1867, 24 miles [38.4 km] from Portland Bay, Port Fairy, Victoria, Australia.

Possible intermediates between nominate race and *caryochrous* in Victoria; further study required. Proposed race *whitei*, from SE South Australia (E from Coorong area and Youngusband Peninsula) and adjacent extreme SW Victoria (R Glenelg), considered inseparable from nominate. Extinct race *litoralis*, geographically isolated in coastal SW Western Australia (Cape Naturaliste S to Cape Mentelle and R Margaret), smaller and brighter than others and apparently vocally different; was possibly a separate species. Two extant subspecies recognized.

**Subspecies and Distribution.**

*D. b. broadbenti* (McCoy, 1867) – coastal SE South Australia (E from the Coorong) and W Victoria (E to Portland Bay).

*D. b. caryochrous* Schodde & Mason, 1999 – from Peterborough I. along coast to Otway Peninsula, in S Victoria.



**Descriptive notes.** 25 cm; c. 77 g. The largest bristlebird, with long graduated tail with rounded tip, short rounded wings, medium-length slightly decurved bill; crown feathers sometimes raised to form short crest. Nominate race has rich rufous cap and ear-coverts, with indistinct black scalloping on crown, nape and hindneck, pale scalloping on side of neck; lores and eyering off-white; upperparts olive-grey with faint reddish-brown wash, indistinct pale brownish-grey scalloping on mantle and back, plain reddish-brown rump and uppertail-coverts; rufous margins on remiges and greater upperwing-coverts (forming rufous panel);

uppertail dark brown, rectrices with narrow rufous-brown fringes; chin off-white, malar area and throat off-white with fine dark mottling; breast dark brown, boldly scalloped with pale grey, centre of belly off-white with fine dark scalloping, side and flanks olive-brown, shading to more red-brown on rear flanks, undertail-coverts and vent; underwing brownish-grey, slightly darker on coverts; iris red to red-brown; bill grey-black, pale grey or pinkish lower mandible grading to darker tip, gape pale yellow or grey; legs grey to grey-brown. Sexes alike. Juvenile is darker than adult, lacks rufous on head, has buff face with indistinct scalloping, plainer underparts. Race *caryochrous* is very similar to nominate but darker. Voice. Song, throughout year and through day, but most frequently in breeding season (when also responds to playback of taped song), a loud, melodious, liquid, penetrating "cheep-cheep-chew-chew-ee-ee" with squeaky and rather grating quality, some phrases resembling sound of a squeaky wheel; regularly sings melodious antiphonal



duets (much more so than *D. brachypterus*), one such duet transcribed as "bet-tip, bet-tip, bet-tip, seeee-church-er-wee", with "cher-wee" of second bird given together with "er-wee" of first bird. Find sometimes sounding like one song! Individuals may be identifiable by their song pattern. Loud staccato "twik" or "tweek" as alarm notes; soft "zit" also given.

**Habitat.** Primarily low, dense shrubland and heathland on coastal dunes and cliffs, sometimes extending up to 40 km inland along valleys in Otway Range (Victoria). Requires low dense cover with clear ground beneath, allowing movement; likes heaths and shrubs or stunted trees and coastal shrubland (*Leucopogon*-*Acacia*-*Olearia* association), often with *Missonium insulare*. Race *caryochrous* in Otway Range occurs in open eucalypt (*Eucalyptus*) forest with dense low understorey, including tea-trees (*Leptospermum*), she-oaks (*Allocasuarina*) and sword-sedge (*Anarthria*). Also in gulleys in cool-temperate myrtle beech (*Nothofagus cunninghamii*) and tall mountain ash (*Eucalyptus regnans*) forest. Haunts edges of dense habitat and often seen in more open areas, such as car parks, tracks and gardens, and blackberry (*Rubus*) patches; the least shy of the family, occurs in gardens in many coastal towns in Victoria. Extinct race *litoralis* poorly known, was evidently restricted to a narrow strip of densely vegetated rounded sandhill habitat.

**Food and Feeding.** Primarily invertebrates (mainly insects), seeds, fruit and green shoots. Invertebrates recorded are cockroaches (Blattodea), larval and adult beetles (Coleoptera, including curculionids), flies (Diptera), cicadas (Cicadidae), hymenopterans (including family Ichneumonidae), lepidopteran larvae and orthopterans, also spiders (Araneae) and earthworms (Annelidae). Vegetable matter reported as eaten includes seeds of *Centaurea* and *Sonchus*, fruits and seeds of chenopods, and fruits of ericaceous plants and of genera *Exocarpus* and *Lycium*. Food scraps provided by humans also taken, e.g. around car parks. Usually forages singly or in pairs in dense vegetation, but quite often along thicket edges and in the open if undisturbed; the least shy of the bristlebirds, although still elusive. Walks or hops slowly through vegetation, makes occasional short dashes. Feeds on or just above ground, among leaf litter, on open ground or in foliage. Pecks at ground or probes with bill, with quick jerky movements; sweeps bill from side to side, moving leaves. Occasionally gleans from foliage. Has in the past been recorded as foraging on sandy beaches and picking from seaweed, or picking beetles from sand.

**Breeding.** Season Aug–Jan; single-brooded. Probably mates for life. Nests as simple pair, apparently occupying same site over long period; pair or single individuals apparently occupies home range all year. Female may build nest unaided, construction reportedly taking 2–3 days, nest large (much larger than those of congeners), bulky and domed (resembling a rugby ball placed on side), with side entrance near top, sometimes a broad platform of sedge leaves at entrance, loosely built from coarse and stiff grass or sedge stalks, twigs, rushes, sticks, bark strips, dry leaves and fibrous rootlets, lined with soft, fine dry grass, fur, rootlets, leaves or wool, sometimes also human artefacts (toilet paper noted), placed close to ground in tussock, sedges or low shrub, usually within dense cover; territory 1.5–3 ha. Clutch almost always 2 eggs, very variable, often dull pale brown, sometimes almost white, with purplish splotches, c. 27 × 21 mm; if clutch lost, replacement probably laid; incubation by female alone, period 16–21 days; chicks fed by both sexes, nestling period

18–21 days. Nests sometimes parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*). Claimed that one egg often infertile, and added eggs were quite often found in nests in the past; readily deserts nest.

**Movements.** Resident with some local movement, especially after fires. In ringing programmes and radio-tracking studies, adult movement found to be in metres, rather than kilometres, but immatures can disperse a few kilometres in suitable habitat.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in South-east Australia EBA and (formerly) South-west Australia EBA. Race *litoralis* (almost certainly extinct) listed on CITES I. Race *caryochrous* listed in Australia as "Vulnerable"; numbers estimated as well above 4000 individuals and perhaps more than 10,000. The recently expanded Otway National Park should help to secure the habitat for this race, so long as management is suitable. For nominate race, the Coorong population, the largest, is thought to have been relatively stable, with reporting rate on Naracoorte Coastal Plain (core bioregion for this race) almost identical in the two Atlas periods, 1977–1981 and 1998–2001; total South Australia population c. 17,800 individuals. Reporting rate for Victorian population of this race has also remained constant. W race *litoralis* was restricted to a narrow strip of densely vegetated rounded sandhill habitat extending c. 75 km between Cape Naturaliste and Cape Leeuwin, in extreme SW Western Australia; last recorded in 1906–1908, not long after its initial discovery, with unconfirmed reports in 1940, 1977 and 1980; presumed extinct. This species probably already had a narrow linear disjunct distribution at time of settlement by Europeans; subsequent land clearance for agriculture, grazing and settlement has led to extinction of one race and decline of others. Now vulnerable to further habitat fragmentation and invasion by exotic species, which may unfavourably alter habitat composition. Overgrazing by rabbits (*Oryctolagus*) may affect habitat, and species is vulnerable to predation by foxes (*Vulpes*) and feral cats. May be adversely affected by off-road driving by four-wheel-drive vehicles, motorbikes and dune buggies in sand dunes. Readily deserts nest, perhaps a factor in decline if disturbance has increased. Controlled annual burning can be a problem, as are the maintenance of firebreaks and the slashing of heathland and roadside vegetation. Creeping suburbanization also a potential threat, causing continued habitat fragmentation and degradation. Considerable habitat now within national parks or reserves, but fires remain a constant threat, exacerbated by drought conditions. Species is still quite widespread in two core areas, and, with adequate management, prospects for its long-term survival are reasonably good.

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## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family ACANTHIZIDAE (THORNBILLS)



- Small to medium-small passerines, most with short and rounded wings and fairly short tail, slender bill, a few with deeper and broader bill, terrestrial species with relatively strong legs and feet; plumage olive-green or drab brown, many species with some rufous, yellow or white patches, some also streaked.
- 8-19 cm.



- Australasian Region and south-west Pacific, three species in Oriental Region.
- Varied habitats, from tropical rainforest, mangroves and saltmarsh to dry woodland, heath and arid scrub.
- 14 genera, 63 species, 196 taxa.
- 2 species threatened; 1 extinct since 1600.

## Systematics

The family Acanthizidae is a diverse assemblage of very small to medium-sized, often dull-plumaged and primarily insectivorous passerines, centred in the Australasian faunal zone. As presently constituted, the family comprises some 63 species in 14 genera, seven of which are monotypic. Australia has 13 genera, of which ten are restricted to that country, and a total of 41 species. New Guinea has 21 species in four genera; one genus is endemic in that island and the remaining three are shared with Australia.

Two species of gerygone (*Gerygone*) reach the New Zealand area, and one extends into the Pacific through New Caledonia, Vanuatu and the Solomons island of Rennell; two insular species are confined to small islands between Australia and New Zealand, although one of these, the Lord Howe Gerygone (*Gerygone insularis*), is now extinct (see Status and Conservation). Three gerygones extend into Indonesia, two of them only on very small or small islands, the other species reaching the Asian mainland and the Philippines in the Oriental faunal zone. The genus *Gerygone* has the widest distribution of all the acanthizids.

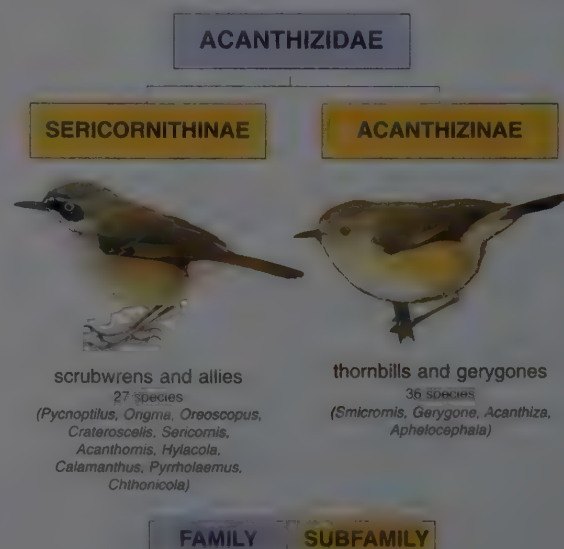
Although the three species of bristlebird (*Dasyornis*) are usually included in this family, they appear to be anomalous, differing from acanthizids in, for example, morphology. They are probably best treated as a separate family, Dasyornithidae, pending further research. Both the bristlebirds and the acanthizids are sometimes incorporated with the pardalotes (*Pardalotus*) in a broad family Pardalotidae, in which they are normally treated as two separate subfamilies, respectively Dasyornithinae and Acanthizinae. Although this was the preferred treatment of C. G. Sibley and J. E. Ahlquist in 1990, of L. Christidis and W. E. Boles in 1994, and of R. Schodde and I. J. Mason in 1999, recent work does not support this arrangement and future developments will surely produce more revisions.

The Pilotbird (*Pycnopsittacus floccosus*) is something of an oddity, having features in common with both the bristlebirds and the acanthizids. More molecular-genetic research is required in order to elucidate its exact position. It is possible that the bristlebird-like characters may be due to convergence, and for this reason it is left, at least for the time being, in Acanthizidae, as an aberrant member of the family.

The acanthizids may be divided into two subfamilies. The first, Sericornithinae, includes the mouse-warblers in the genus

*Crateroscelis*, the scrubwrens in *Sericornis*, the heathwrens in *Hylacola*, the fieldwrens in *Calamanthus*, and the five monotypic genera *Origma*, *Oreoscopus*, *Acanthornis*, *Pyrholaemus* and *Chthonicola*. Despite its anomalous appearance, and for the sake of convenience alone, the Pilotbird is included in this subfamily, although it might not belong with it. The other subfamily, Acanthizinae, includes the remaining members of the family: the Weebill (*Smicromis brevirostris*), the 19 extant gerygones (*Gerygone*), known also as fairy-warblers or flyeaters, the 13 thornbills (*Acanthiza*) and the three whitefaces (*Aphelocephala*). The three species of *Mohoua*, a New Zealand genus, are occasionally grouped with this latter subfamily, although, in the present treatment, they are provisionally placed with the whistlers in the family Pachycephalidae.

From this assemblage, a geographical analysis reveals the following. Australia, including Tasmania, has 35 endemic species and ten endemic genera of acanthizids, the respective figures for New Guinea being 15 and one; the region of New Guinea and Australia combined holds six endemic species and two en-



Subdivision of the  
Acanthizidae

[Figure: Tim Worfolk]

There is some uncertainty as to whether the **Pilotbird**, the only species in its genus, belongs with the thornbills (Acanthizidae) or bristlebirds (Dasyornithidae), as it shows features associated with both families. Current thinking suggests grouping with the former to be the correct treatment, and points to the similarities with the latter family perhaps being a result of convergent evolution. Taken as an acanthizid, it is the largest and heaviest member of the family, and is unusual in having a long, rounded tail that it often cocks, or flicks up and down. Its powerful legs and feet are an adaptation to a life spent foraging in the leaf litter.

[*Pycnoptilus floccosus*,  
Australia.  
Photo: E. McNamara/  
Ardea]



demic genera. Otherwise, four species (one extinct) are confined to New Zealand and the isolated islands of Norfolk, Lord Howe and the Chathams, and one is restricted to the western Pacific Ocean islands, while two species are found only in the Indonesian archipelago, and one is distributed in mainland South-east Asia, Indonesia and the Philippines.

As indicated by these figures, the origins of the group clearly lie within the Australo-Papuan region. During ice ages, when lower sea-levels permitted the formation of land-bridges, the spread of this avian group and of associated vegetational types was facilitated. In subsequent warmer periods, however, a higher sea-level allowed acanthizid forms to diverge in isolation on reformed islands. The precise chronology of this process awaits advances in our understanding both of molecular techniques and of glaciation in the region.

A zoogeographical analysis of distributions would suggest that the *Acanthiza* thornbills originated in Australia, where all except one of the 13 species are found. The *Sericornis* scrubwrens are more evenly spread between Australia, which has five en-

demic members of this genus, and New Guinea, which has seven, with only one species common to the two areas, indicating the possibility that *Sericornis* could have originated from either region. The genus *Gerygone* is more complex still, with four species unique to New Guinea, two confined to Australia, and five taxa shared. Ancient radiations resulted in further spread, with four species (one now extinct) in New Zealand and associated islands, three from south-eastern Asia to Indonesia, and a single species in the Pacific region. Australia harbours the majority of the remaining genera, including *Pycnoptilus*, containing the Pilotbird, and six other monotypic ones represented by the Rockwarbler (*Origma solitaria*), the Fernwren (*Oreoscopus gutturalis*), the Scrubtit (*Acanthornis magna*), the Redthroat (*Pyrholaemus brunneus*), the Speckled Warbler (*Chthonicola sagittatus*) and the Weebill (*Smicrornis*), along with the three *Calamanthus* fieldwrens, the two *Hylacola* heathwrens, and the three *Aphelocephala* whitefaces. New Guinea is home to the three mouse-warblers in the genus *Crateroscelis*.

The taxonomy of the group is complex and has been reviewed by various authorities. Most notable are the 1985 and 1990 studies by Sibley and Ahlquist, based on the techniques of DNA-DNA hybridization, and those undertaken in the early 1990s by Christidis and Schodde, using protein allozymes. It had always been assumed that the origins of the group lay in the Northern Hemisphere radiation of taxa. The studies by Christidis and Schodde, however, indicated that this was not the case and that, rather, the Acanthizidae belonged to the great Australo-Papuan corvid lineage, a separate, ancient radiation, a discovery that has had a major impact on evolutionary studies. These analyses further indicated that the Acanthizidae, along with the honeyeaters (Meliphagidae) and the fairy-wrens (Maluridae), were members of a superfamily Meliphagoidea, a quite different result from those of earlier studies, which placed them variously among the Old World warblers (Sylviidae), with the babblers (Timaliidae), or together with the fairy-wrens as a subfamily Malurinae of the Old World flycatchers (Muscicapidae).

As intimated near the beginning of this section, recent studies indicate that *Pardalotus* is a divergent genus and is best treated in its own, separate family, and not including the bristlebirds and the acanthizids. The nearest relatives of the Acanthizidae are, nevertheless, the pardalotes, the honeyeaters and the fairy-wrens, the group occupying the broad "warbler niche" within Australia, being primarily insectivorous, as are the similar but unrelated

The **Rockwarbler**, constituting another monotypic genus, is superficially similar to the Pilotbird (*Pycnoptilus floccosus*), being terrestrial and long-tailed with rufous-brown plumage. It is, however, smaller and slimmer with a square-ended tail and a whitish throat. As its English name suggests, it is closely linked to rocky habitats.

[*Origma solitaria*,  
Brisbane Water  
National Park,  
Australia.  
Photo: Rolf Kunz]







New Guinea is home to the three mouse-warblers in the genus *Crateroscelis*. As is typical of ground-dwellers, these birds have strong legs and feet. Rarely giving good views, as they skulk in dense forest undergrowth, the mouse-warblers tend to be difficult to identify, but can be differentiated by underpart coloration. Only the appropriately named **Bicoloured Mouse-warbler** lacks a white throat, and its concolorous throat and breast are shown to good effect in this photograph. There is little interspecific overlap in altitudinal range, the Bicoloured Mouse-warbler tending to occur at altitudes intermediate between those of its congeners.

[*Crateroscelis nigrorufa*  
*nigrorufa*,  
Crater Mountain,  
EC New Guinea.  
Photo: William S. Peckover]

syliiid warblers of the Old World and parulid warblers of the New World.

The sequence of genera within Acanthizidae is complex, controversial and unresolved, and further genetic and morphological studies and fieldwork are required in order to clarify some aspects of the inter-relationships of genera and species. Various arrangements have been followed, such as the merging of the genus *Oreoscopus* with *Crateroscelis*, and the placing of the *Calamanthus* fieldwrens, the *Hylacola* heathwrens, the Redthroat and the Speckled Warbler in the scrubwren genus *Sericornis*. This proved unworkable, however, as several of the enlarged genera were then paraphyletic and differed greatly from each other in genomic distances. Both Sibley and B. L. Monroe, in 1990, and Christidis and Boles, four years later, reverted to the 1926 arrangement drawn up by the Royal Australasian Ornithologists Union, and the entire taxonomic arrangement of the group is still very much ■ work in progress. Schodde has shown *Acanthornis*, the Scrubtit, to be osteologically very divergent, its ancestral form linked by karyological and protein data to *Calamanthus-Pyrholaemus*. On osteological characters, the Fernwren stands apart from the mouse-warblers, although its nearest relatives seem to be among these and the *Sericornis* scrubwrens.

In skeletal and morphological features, as well as in their general biology, the Rockwarbler, in *Origma*, the fieldwrens and heathwrens, and the Speckled Warbler and Redthroat assemblages are all closer to each other than they are to the other acanthizids. They do, however, exhibit significant differences among themselves in skeletal form, chromosomes, behaviour, plumage and egg pigmentation which warrant their continued generic separation at present.

Forming the subfamily Acanthizinae, the four remaining acanthizid genera, *Smicronis*, *Gerygone*, *Acanthiza* and *Aphelocephala*, are well established and their recognition is supported by morphological, behavioural and genetic data.

The ancestral gerygone was possibly a pale-bellied bird, perhaps resembling the Brown (*Gerygone mouki*) or Western Gerygone (*Gerygone fusca*), and originating in Australo-Papua. The gerygones of the south-west Pacific islands derive from two Australian lineages, based on those two respective species. The Chatham Gerygone (*Gerygone albofrontata*) may be an ancient stock surviving from an earlier invasion that subsequently died

out in mainland New Zealand. Alternatively, it may be a well-differentiated member of the group formed by the Grey Gerygone (*Gerygone igata*) and Brown Gerygone, following rapid evolution after colonization by a small founder population. The gerygones of the Malay-Indonesian islands appear to be offshoots of White-throated (*Gerygone olivacea*) and, perhaps, Western Gerygone stocks, although some molecular-genetic analyses suggest that the Rufous-sided Gerygone (*Gerygone dorsalis*) of the eastern Lesser Sunda is sister to a group formed by the Large-billed (*Gerygone magnirostris*) and Yellow-bellied Gerygones (*Gerygone chrysogaster*) of the New Guinea region.

Clearly, much work remains to be done with the genus, and many further revisions are likely. The Golden-bellied Gerygone (*Gerygone sulphurea*) is a case in point. On the basis of its songs, as well as some plumage differences and consideration of its geographical distribution, the species could easily be split into two or three species, along the lines of the recent taxonomic changes applied to the genera *Seicercus* and *Phylloscopus* in Asia.

A more vexing problem is found among the *Sericornis* scrubwrens, in particular the complex of taxa that make up the assemblage containing the Large (*Sericornis nouhuysi*), Perplexing (*Sericornis virgatus*), Tropical (*Sericornis beccarii*) and Large-billed Scrubwrens (*Sericornis magnirostra*). Further research is needed, but it is possible that several cryptic species lie hidden here among the montane New Guinea taxa. In far north Queensland, in north-east Australia, Large-billed Scrubwrens of the subspecies *viridior* intergrade with Tropical Scrubwrens of the race *dubius* in a zone where the two species meet. Farther north, however, the Tropical Scrubwren looks, behaves and sounds totally different and maintains its separate identity, although there is evidence of past gene-flow at a time when its northern race *minimus* was in contact with *dubius*. Molecular-genetic research and a study of vocalizations, combined with field observations and data on plumage, are required in order to obtain an accurate picture of the relationships of these taxa. In New Guinea the situation is even more complex, the aptly named Perplexing Scrubwren providing an exercise in the theology of classification, with many specimens basically of uncertain placement. Vocal and genetic data would be very useful here as ■ means of unravelling a major taxonomic puzzle. The situation can become very unclear and confusing, especially

The *Sericornis scrubwrens* are currently considered to comprise 13 species, divided between New Guinea and Australia. One species occurs in both, suggesting that the genus could have originated in either region. The internal taxonomy of the genus remains unclear, and it is possible that several cryptic species remain to be separated, particularly in the mountains of New Guinea. The **Pale-billed Scrubwren** occurs in New Guinea's lowland and hill forests. Although all seven of its subspecies share the distinctive pale bill enshrined in the species' English name, they differ in minor plumage features such as crown colour.

[*Sericornis spilodera guttatus*,  
Baiyer River,  
EC New Guinea.

Photo: William S. Peckover]



with *Sericornis*, nicely illustrating the problems encountered when trying always to fit taxa into neat and tidy man-made species boxes. Genetic data can certainly help to unpick genealogies, but morphological and, particularly, acoustic data are always important pieces of the picture.

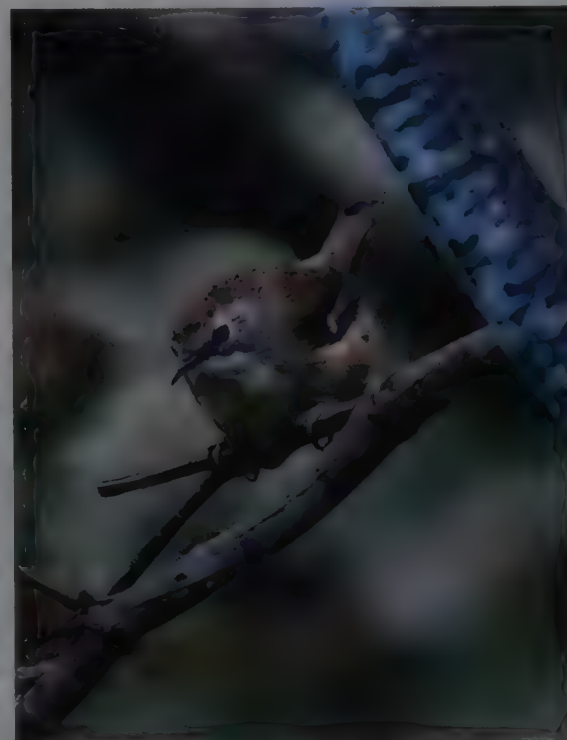
An interesting and unexpected situation exists with the White-browed Scrubwren (*Sericornis frontalis*) and the Atherton Scrubwren (*Sericornis keri*). In this case, the latter seems to be quite recently derived from the former, and it is very similar to the White-browed Scrubwren in terms of its nest and eggs. On the other hand, there are strong plumage similarities between the Atherton Scrubwren and the Large-billed Scrubwren. Clearly, the unravelling of the relationships among the members of the genus *Sericornis* will demand a great deal of research.

Another complex situation exists among the fieldwrens. Boles, in his latest review, has summarized the situation as follows. In 1975, Schodde treated the Rufous (*Calamanthus campestris*) and Western Fieldwrens (*Calamanthus montanellus*) as subspecies of the Striated Fieldwren (*Calamanthus fuliginosus*), following H. Condon's 1951 treatment. In the early 1980s, however, S. A. Parker and H. J. Eckert presented a case for the recognizing of two species, *C. fuliginosus* and *C. campestris*, the latter including *montanellus* as a race, and this arrangement was accepted by most subsequent authors. Some 16 years later, Schodde and Mason subdivided "*C. campestris*" into two species, *C. montanellus* in south-western Australia and *C. campestris*, the latter distributed from the Pilbara coast and Shark Bay islands in the west, eastwards through central Western Australia and South Australia to the mallee of Victoria. They noted, however, that this action was provisional; it was based on consideration of intergradient forms, loss of pigmentation and morphological criteria, but required a number of assumptions. These authors suggested that the geography of speciation in fieldwrens parallels that in the "*Acanthiza reguloides-iredalei* thornbill superspecies"; on the other hand, J. A. Nicholls and co-workers concluded, on the basis of DNA-sequence analysis, that these two *Acanthiza* species are not each other's closest relatives.

For the time being, it is probably best to treat the fieldwrens as three separate species, as did Schodde and Mason in their 1999 "Directory". This is primarily because there seem to be distinct plumage and vocal differences between *montanellus* and the other

western taxa, notwithstanding the fact that much further work is required to clarify and, if possible, finalize the arrangement.

Vernacular names among the Acanthizidae, as with many other bird groups, have sometimes been contentious. During the 1990s, it was the vogue to use the scientific names as vernacular names, so that heathwrens became "hylacolas" and fieldwrens became "calamanthus". These new names, however, were not overly popular, nor were they widely accepted, and there has been a general shift back to the basic English names. As with the name "scrubwren", these older names also provide a clue to



Occupying one of several monospecific genera in the family, the **Scrubtit** is endemic to rainforest and moist eucalypt forest on two islands, Tasmania and King, off the coast of south-east Australia. In some respects, the Scrubtit resembles a scrubwren (*Sericornis*), and it was formerly placed in that genus. However, it is much more clearly marked than the only sympatric *Sericornis*, the Tasmanian Scrubwren (*S. humilis*). In particular, it has a striking head pattern consisting of a pale supercilium and eyering contrasting with a dusky ear-covert mask. In addition, the eye is pale and the bill short and slightly decurved.

[*Acanthornis magna magna*,  
Tasmania, Australia.  
Photo: Marcus Lawson]





The two *Hylacola* heathwrens are fairly small terrestrial acanthizids with long, cocked tails. They share several plumage features: an extensively dark tail, with pale tips to all bar the central pair of rectrices; chestnut uppertail- and undertail-coverts; and narrow wingbars on the median and greater wing-coverts, with a white flash on the base of the primaries. This last feature is more prominent on the *Shy Heathwren*, an appropriately named skulker of dense heath understorey in mallee woodland.

[*Hylacola cauta macrorhyncha*, Nombinnie Nature Reserve, New South Wales, Australia. Photo: Andy & Gill Swash]

the preferred habitat. On the other hand, *Origma solitaria*, the Rockwarbler, would perhaps be better referred to as the "Origma", as the designation of "warbler" is not very helpful and is taxonomically misleading. A similar problem applies to the current English name for *Chthonicola sagittatus*, the Speckled Warbler, but it seems unlikely that this will be replaced by the taxonomically more precise name of "Speckled Chthonicola". Common names inevitably change over time, but a rush to standardize English names is not useful if imposed arbitrarily and without consensus. *Gerygone*, pronounced as "jerigony", is a further example of a "difficult" name, but the alternative of "fairy-warbler" is clumsy and the appellation "flyeater" has not yet been widely accepted. The scientific name *Gerygone* does at least have a nice derivation, meaning "born of sound" or "born of song" (see Voice).

Some members of the family are very poorly known, with the Plain Gerygone (*Gerygone inornata*) of Timor and the Rufous-sided Gerygone of the Lesser Sundas among the least-studied of the group. The Biak Gerygone (*Gerygone hypoxantha*), from a long-isolated New Guinea island harbouring a number of other endemic species, is likewise almost unknown; it is often thought to be a subspecies of the Large-billed Gerygone and, with such questions over its taxonomic status, there is a need for much research to extend our knowledge of this Endangered acanthizid (see Status and Conservation). Among the New Guinea species, none of the mouse-warblers is well known and it is possible that some races of the Mountain Mouse-warbler (*Crateroscelis robusta*) could be elevated to species rank, while the very locally distributed Bicoloured Mouse-warbler (*Crateroscelis nigrorufa*) has received little study, even its voice being poorly known.

Two curious birds have at various times in the past been thought to be full acanthizid species. One of these is the mysterious "Black-and-green Scrubwren" from Papua New Guinea, which was given the scientific name "*Sericornis nigroviridis*"; it appears, however, to be an aberrant melanistic example of the Buff-faced Scrubwren (*Sericornis perspicillatus*). The other involves a classic case of mistaken identity. The "Rusty-tailed Gerygone" was described in 1985 as a new species, "*Gerygone ruficauda*", but this was based on discoloured specimens of the Yellow-bellied Gerygone of New Guinea; these had been incorrectly labelled with a vague locality in eastern Queensland, in north-east Australia, which totally misled the hapless museum workers,

### Morphological Aspects

Most acanthizids are small olive-green birds inhabiting shrubs and trees or small drab brown birds of the understorey. The tiny Weebill, with a length of 8–9.5 cm and weighing no more than about 6 g, is often considered to be the smallest Australian passerine. Some of the gerygones and thornbills are almost as small and certainly no heavier. At the opposite extreme, the Pilotbird is the largest member of the family, being 17–19 cm long and 27 g in weight.

Acanthizid wings tend to be short and rounded, as expected for species that are essentially sedentary. There are ten primaries and nine secondaries, with a vestigial tenth secondary. The tail has twelve rectrices, frequently with a dark subterminal band



Fieldwrens of the genus *Calamanthus* are small, heavily streaked species with short, stout bills and long, slightly graduated tails that are normally held cocked. There are currently thought to be three fieldwren species, differentiated on the basis of plumage and voice, but further work is necessary to clarify the situation. The *Rufous Fieldwren* was only awarded species status as recently as the early 1980s, having previously been treated as a subspecies of the *Striated Fieldwren* (*C. fuliginosus*).

[*Calamanthus campestris winiam*, Little Desert National Park, Victoria, Australia. Photo: David Fisher]

The perky, long-tailed **Redthroat** is the only member of its genus. It resembles a scrubwren (*Sericornis*), although it is probably most closely related to the Speckled Warbler (*Chthonicola sagittatus*), and indeed these two monotypic genera are sometimes merged. Plumagewise, the Redthroat is basically grey-brown, with broad white corners to the base of its otherwise dark tail. It is one of the few family members to show sexual dimorphism in plumage: only the male has the chestnut chin and throat that gives the species its English name. The Redthroat inhabits arid and semi-arid scrubland, often along watercourses, across much of Australia.

[*Pyrholaemus brunneus*,  
Corunna Station,  
South Australia, Australia.  
Photo: Graeme Chapman]



and a pale tip. Most members of the family have a fairly short tail, the aberrant Pilotbird being an exception in having a fairly long one. The tail of the heathwrens and fieldwrens is of medium length.

The great majority of the Acanthizidae have a slender bill, a typical character of small insectivores. Minor differences in size and proportion may be significant in cases when habitat-partitioning is evident with sympatric species, reflecting dietary and foraging differences among them. The Buff-rumped Thornbill (*Acanthiza reguloides*) has a deeper, broader bill than those of its congeners, which would presumably be a manifestation of such differences.

For such a small bird, the Fernwren has a curiously long and straight bill, with fused nasal operculae, well adapted for forag-

ing deep in shady damp patches, rummaging among leaf litter, probing and, often, almost burying itself among the debris of the substrate. Despite its name, the Large-billed Scrubwren does not have a particularly large bill, but it is nevertheless larger than those of its congeners, reflecting the probing and gleaning niche occupied by this species as it works up trunks, among vines and leaves and along branches. The Weebill has a short, deep bill which it uses in order to pry off lerp insects (*Psyllidae*), which form a major part of its diet. This is an unusually shaped bill within the family, and it presumably reflects such a dietary specialization. Whitefaces, too, possess a deep finch-like bill, with which they crack open the small hard seeds of xeric plants; the hard-muscled stomach of these species is specially adapted for this diet.

Unsurprisingly, the Pilotbird has powerful legs and feet, adapted for foraging in dense leaf litter. Likewise, the strongly terrestrial Yellow-throated Scrubwren (*Sericornis citreogularis*) and, perhaps, the mouse-warblers seem to have quite large legs and feet, well suited to their ground-dwelling habits.

Broadly speaking, brightly coloured plumages are lacking in this family, the majority of males having female-like plumage. Many species are cryptically coloured and live in dark shady areas, as illustrated by the Fernwren, the mouse-warblers, the Pilotbird and some scrubwrens. The gerygones tend more towards brighter colours, with green and yellow a common combination. The best-marked of the group are the three whiteface species, the Fairy Gerygone (*Gerygone palpebrosa*) and the delightful White-throated Gerygone.

Rufous and rusty rump coloration is a strong feature among the thornbills, which comprise a chestnut-rumped group, consisting of the Chestnut-rumped (*Acanthiza uropygialis*), Brown (*Acanthiza pusilla*), Inland (*Acanthiza apicalis*), Tasmanian (*Acanthiza ewingii*), Mountain (*Acanthiza katherina*) and Slaty-backed Thornbills (*Acanthiza robustirostris*), and five other species with a buffy or yellow rump, namely the Yellow-rumped (*Acanthiza chrysorrhoa*), Buff-rumped, Western (*Acanthiza inornata*), Slender-billed (*Acanthiza iredalei*) and Yellow Thornbills (*Acanthiza nana*). The Papuan (*Acanthiza murina*) and Striated Thornbills (*Acanthiza lineata*) differ in having an olive rump. The two heathwrens exhibit strong rusty coloration on the rump and uppertail-coverts, and the Rufous and Western Fieldwrens display varying degrees of rufous on the upperparts. The Rockwarbler and the Pilotbird are both quite rusty below, the former being entirely rich brown above. The whitefaces are among the most striking members of the family, the Chestnut-breasted Whiteface (*Aphelocephala pectoralis*) showing a broad

Found across most of Australia, the **Weebill** is usually considered to be the continent's smallest bird, measuring just 8-9.5 cm and weighing a mere 6 g. Both vernacular and scientific names make reference to its short, stubby, deep bill. Among the Acanthizidae, this is an unusual shape, which appears to reflect its specialization in prying off lerp insects (*Psyllidae*). Weebills in the north average smaller, paler and yellower than others, differences that have led some authors to split them as a separate species.



[*Sericornis brevirostris*  
*brevirostris*,  
Round Hill,  
New South Wales,  
Australia.  
Photo: Graeme Chapman]





rufous breastband and varying degrees of rufous on the flanks and upperparts, while the Banded Whiteface (*Aphelocephala nigricincta*) has rufous scalloping on the flanks and cinnamon-rufous on the upperparts. Similarly, the western subspecies of the Southern Whiteface (*Aphelocephala leucopsis*) shows chestnut scalloping on the flanks, as intimated by its scientific name of *castaneiventris*.

Streaking and spotting are quite common among many of the genera, with the Speckled Warbler the most strikingly marked, followed by the heathwrens and the fieldwrens. None of the

gerygones has obvious streaking, but such markings are common on the chin and throat of thornbills, and are best developed in the Striated Thornbill, which is extensively streaked below. Among the scrubwrens, the complex of taxa which constitute the White-browed Scrubwren can vary from being plain below to having a heavily streaked or spotted underside. The Tropical Scrubwren of the race *minus* can be well streaked dark below, but most taxa in that group are plain.

Some species exhibit sexual dimorphism. This is demonstrated by, for example, the Yellow-throated and White-browed Scrubwrens, some races of the Tropical Scrubwren, the Fairy Gerygone, the Redthroat, the Speckled Warbler, the Striated Fieldwren and, possibly, the Fernwren. None of the thornbills, however, is sexually dimorphic, and plumage dimorphism is, indeed, not common within the family.

Examples fitting Gloger's Rule, which states that species become darker in areas of higher rainfall and, conversely, paler in the drier zones, are well presented in the family. In Australia, for instance, the subspecies *harterti* of the White-browed Scrubwren occurs in the Otway and Strzelecki Ranges of South Victoria, a wet region, and has darker upperparts and richer yellow underparts than do those taxa in drier areas, while the race *maculatus* in high-rainfall south-west Western Australia also has darker, yellower underparts. Chestnut-rumped Heathwrens of the subspecies *pedleri* in the dry south Flinders Ranges of South Australia are the most pallid of the three races of that species.

For those species for which the relevant information is available, the moult strategies of the Acanthizidae are unexceptional. Adults undergo a complete post-breeding moult once yearly. Juveniles evidently have their first moult about one to two months after fledging, and in this they replace the body feathers and the marginal wing-coverts. It appears that for some juveniles, at least of some of the species, the first moult is a more or less complete one, so that the remiges and rectrices and all or most of the wing-coverts are replaced.

Acanthizids are among the classic "little brown jobs", often impossible to identify to species when seen only briefly or in poor conditions. With good views, however, it is certainly easy enough to differentiate most of them. Thornbills, the genus

The most numerous and widespread genus in Acanthizidae is Gerygone, with 19 species ranging from the Asian mainland through to New Caledonia and New Zealand. The ancestor of this radiation is probably a pale-bellied bird originating in the Australo-Papuan region. Noting its pale underparts, it is not difficult to imagine the **Large-billed Gerygone** of New Guinea and Australia as part of such a lineage. This species inhabits mangroves, a relatively infrequent choice of abode for a genus that divides broadly into rainforest dwellers and denizens of drier woodland.

[*Gerygone magnirostris cairnsensis*, Cardwell, N Queensland, Australia.  
Photo: Clifford & Dawn Frith]



Thornbills (Acanthiza) are small, dumpy birds with medium-length, slightly stocky bills. Their medium-length tails are often held at an angle. Typically for the Acanthizidae, no thornbill displays sexual dimorphism in plumage or morphology. Although the basic plumage pattern is brown, most of the 13 species of thornbill have a contrastingly coloured rump, be it rusty, buff or olive, as well as a streaked throat. The **Brown Thornbill** fits this mould, with a rufous rump that complements its chestnut forehead and red eye. The taxonomy of this species is complex, as it was once thought to be conspecific with the Inland Thornbill (*A. apicalis*), with which it probably hybridizes in south-eastern South Australia.

[*Acanthiza pusilla pusilla*, Werribee, Victoria, Australia.  
Photo: Peter Fuller]

*Acanthiza*, are readily told by their shape, plumage, eye colour and call, and are divided into the more arboreal red-eyed or brown-eyed species, comprising the Brown, Inland, Tasmanian, Yellow, Slaty-backed, Yellow-rumped and Striated Thornbills, and the often more terrestrial pale-eyed group, made up by the remaining six members of the genus. The identifying of scrubwrens in Australia is quite straightforward until one comes to the Large-billed and Atherton Scrubwrens, which are easily confused, although altitude is a useful indicator; it is doubtful that these two really are sympatric at many sites, being more parapatric and separated by altitude. New Guinea scrubwrens are, again, separable by the altitudes at which they are found, as well as by plumage features and, particularly, song, but in the case of the Perplexing Scrubwren much remains unknown and the taxonomy is unresolved.

Mouse-warblers are quite difficult to identify, as they rarely provide the observer with a good view, but the three species differ in the colour of the underparts. In addition, elevational range is helpful, with zones of altitudinal overlap being quite narrow. The Fernwren, a restricted-range species confined to the rainforests of far north-east Queensland, has a distinct shape and largely terrestrial habits, as well as a diagnostic head pattern. It is worth looking closely at presumed pairs of this acanthizid, as the extent to which it exhibits sexual plumage dimorphism is unclear. Whereas the plumage of museum specimens of Fernwrens is reported as being the same for both sexes, field observations suggest otherwise. Presumed females appear duller than presumed males, and to possess a smaller breast-crescent and a less distinct supercilium. Although it is sometimes claimed that this is due to individual variation and that the sexes are similar, this seems unlikely in view of the frequent sightings of two such differently plumaged individual Fernwrens in close association with each other.

All of the gerygones are small specialist insectivores that glean or snatch their prey from foliage. The 19 species tend to be ecologically and morphologically similar but specialized on different habitats, replacing each other in an often largely allopatric pattern. Consequently, the identifying of gerygones is still something of a challenge, but each has distinct plumage characters

and vocalizations and should, if seen well, be readily distinguishable, with habitat also a valuable guide. It is rare to find more than three species of gerygone at any one site, although, in Australia, some riparian habitats on the Atherton Tablelands of Queensland may hold Large-billed, Brown, Fairy and White-throated Gerygones, along with the Large-billed Scrubwren, in very close proximity to one another.

The fieldwrens and the heathwrens are distinctive enough within their respective ranges, albeit often shy and skulking, while the Redthroat of the semi-arid zones has striking tail markings and is easy to identify if seen well. In Tasmania, the Scrubtit is superficially like a *Sericornis* scrubwren but is much better marked than the Tasmanian Scrubwren (*Sericornis humilis*), having a very distinctive face pattern. The Pilotbird and the Rockwarbler tend to be separated by habitat, and they are, in any case, distinguishable by their size and plumage pattern. The aberrant seed-eating whitefaces are quite distinctive, although all three species have sometimes been seen in one flock in South Australia.

## Habitat

The Acanthizidae are fairly catholic in their habitat preferences, with many species in the tropical forests of New Guinea, which is a major centre for *Sericornis* scrubwrens, and in the rainforests, woodlands, semi-arid and arid zones of Australia. Altitude plays a very significant role in New Guinea, with its abundance of high mountain ranges, and the various acanthizid species here have divided up the available habitats on broad elevational lines, with usually no more than two scrubwren species occurring in overlapping areas. A general, simplified overview is that the highest-altitude species is the Papuan Scrubwren (*Sericornis papuensis*), a vocal inhabitant of the zone between 1500 m and the tree-line, co-existing in the lower parts of that range with the Large Scrubwren, which in turn is sympatric with the Buff-faced Scrubwren lower down still. The Grey-green Scrubwren (*Sericornis arfakianus*) occupies a band even farther down, while the hill-forest taxon at the lower limits for scrubwrens is the Pale-

The Acanthizidae do not exhibit much in the way of bright plumage, many species being rather cryptically coloured.

The best-marked members of the family include the trio of whitefaces (*Aphelocephala*), exemplified by this **Banded Whiteface**.

This attractive bird has a bold black breastband, cinnamon scalloping on the flanks and rufous upperparts. All three whitefaces inhabit arid and semi-arid areas, the Banded Whiteface preferring sandy and stony hills and plains with scattered vegetation. They share a deep, finch-like bill, which helps them crack open the hard seeds of xeric plants, a dietary option that prompted the evolution of their hard-muscled stomach.

[*Aphelocephala nigricincta*, north of Innamincka, South Australia, Australia. Photo: Graeme Chapman]







Unlike several other species of thornbill, the **Buff-rumped Thornbill** is a poor mimic. Its song is a rapid, musical tinkling, based on two different notes. The song resembles that of the Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*), but is harder and higher-pitched. As with most members of the genus, foraging flocks of Buff-rumped Thornbills call frequently, uttering a thin, high-pitched twittering as they move through trees. Fledglings are also vocal, begging for food with a constant buzzing call. Puffing out its throat feathers and almost imperceptibly opening its bill, the Buff-rumped Thornbill often sings from exposed branches within open eucalypt woodland.

[*Acanthiza reguloides reguloides*, near Ilford, New South Wales, Australia.  
Photo: Chris Ross]

billed Scrubwren (*Sericornis spilodera*). The Tropical Scrubwren is a lowland specialist only in the Trans-Fly region, other races currently included within this species being more montane.

Within Australia, altitude is a less significant factor in the distribution of these species. Nevertheless, one of them, the Atherton Scrubwren, is restricted to the higher elevations, mainly at 600–1600 m. There is genetic evidence of past hybridization between Atherton and White-browed Scrubwrens, which now come into very limited contact and are almost entirely segregated by habitat and altitude. It is possible that the former species developed from ancestral White-browed Scrubwren stock during a past dry glacial period. Generally, it is again usual for two or three scrubwren species to occur sympatrically, but to be largely segregated by foraging strategy. The Atherton Scrubwren shares its habitat with the distinctive *cairnsi* race of the Yellow-throated Scrubwren, and is more rarely in contact with the Large-billed Scrubwren at the lower elevations, the picture being much confused by misidentifications. The Atherton and Large-billed Scrubwrens look amazingly similar but are not closely related, and their ranges tend to be more parapatric than sympatric, with altitudinal separation coming into play. Farther south, Yellow-throated, White-browed and Large-billed Scrubwrens are sympatric but split into different niches, the White-browed in the drier edge areas, the Yellow-throated in the damper forest floors, and the Large-billed at a higher level in the vegetation, much less terrestrial than the other two species and more given to probing and delving.

Drier woodlands are occupied also by the thornbills. These have evolved to exploit a wide range of niches in Australia and have spread out into the semi-arid and arid zones, where the Slaty-backed and Inland Thornbills are the most tolerant of dry country. Heathwrens and fieldwrens occupy the heath, shrubland and mallee niches, covering vast extents of the landmass. Some have become more specialized, with the subspecies *rosinae* of the Slender-billed Thornbill an inhabitant of samprine shrubland and saltmarsh in South Australia, the other taxa being more in heath and low mallee scrub or chenopod shrublands.

Two sibling species, the Brown and Tasmanian Thornbills, occur alongside each other in Tasmania, the latter species presumably being the original colonizer and the Brown Thornbill

having colonized or recolonized the island via land-bridges when the climate was warmer and drier (see Systematics). The drier vegetation types enabled the newcomer to thrive, and the Tasmanian Thornbill tends now to occupy the higher and wetter regions. There is some habitat-partitioning, too, and the species also exhibit some differences in foraging. Field studies indicate that the Brown Thornbill is mainly on slopes in the winter, with its congener in the densely vegetated gulleys, whereas, in summer, it makes more use of gulleys but feeds mainly higher in the vegetation than does the Tasmanian Thornbill, thereby maintaining some degree of ecological separation.



*Gerygones* may not be mimics but they are classy songsters, and the characteristic refrain of most species is often the first sign of its presence. The song of the **Golden-bellied Gerygone** is remarkable for its variation across the wide distribution of this species. The nominate race in South-east Asia sings up to 10 high-pitched, musical whistles, sometimes in an apparently rather aimless string. The same race occurs in Java, but sings differently, with a descending wheezy phrase of up to five notes.

[*Gerygone sulphurea sulphurea*, Kranji Dam car park, Singapore.  
Photo: Jimmy Chew]

Pretty much the exception within its genus, the **Yellow-throated Scrubwren** is an exceptional mimic, in the south of its range at least. It imitates a range of bird species that may be even greater than the famous repertoire of the Superb Lyrebird (*Menura novaehollandiae*). Within 30 minutes, a group of four scrubwrens was heard to mimic some 26 species, a remarkable feat. But the Yellow-throated Scrubwren does not only mimic. Its normal song is a pleasant sweet warbling series, with interspersed rattling phrases. Females and all birds from northern populations tend to sing and mimic less than southern males, and also to sing more quietly.

[*Sericornis citreogularis intermedius*,  
Lamington National Park,  
Queensland, Australia.  
Photo: Marie Read]



The Fernwren is a specialist of the forest floor. It frequents the damp shady gulleys and rainforest vine thickets in the mountains of far north Queensland, occupying a niche similar to that of the mouse-warblers in New Guinea, but exploited also by Yellow-throated Scrubwrens in the temperate rainforest farther south. One member of the family is confined to New South Wales. This is the Rockwarbler, a petrophilous species which haunts wooded rocky sandstone, limestone and granite areas within 250 km of Sydney, where it is restricted to a fairly small area.

The gerygones can be divided broadly into rainforest species and species of drier woodland, only the Western Gerygone penetrating far into the semi-arid zone. Mangroves are an important habitat for the Mangrove (*Gerygone levigaster*), Large-billed and Dusky Gerygones (*Gerygone tenebrosa*), the first two often sharing the habitat by exploiting different niches and, probably, having different food preferences.

Arid and semi-arid habitats characterize the three whitefaces. In such areas, the Southern Whiteface is found mostly in acacia (*Acacia*) or eucalypt woodland and shrubland with an understorey of grass and low shrubs, especially saltbush (*Atriplex*), bluebush (*Maireana*) and emu-bush (*Eremophila*). It sometimes occurs in woodlands of cypress pine (*Callitris*). The Chestnut-breasted Whiteface lives in chenopod shrublands in open stony desert and similar areas, being often found on stony hills and gibber tablelands. It tends to avoid more densely vegetated places, but it does display a liking for patchy cover of bluebush, emu-bush and saltbush. Sandy and stony hills and plains with scattered vegetation are the home also of the Banded Whiteface, which inhabits areas with the same types of scattered vegetation as those preferred by its congeners, but also with species of *Cassia* and *Hakea*. This species extends also into grassland with scattered shrubs, and often with spinifex (*Triodia*). It seems to be fond of burnt and dead areas.

Some exotic species of plant which form or become part of thickets are quite significant within Australia in providing nesting cover for certain bird species. The White-browed Scrubwren uses such areas with lantana (*Lantana*), blackberry (*Rubus*), rose (*Rosa*) and privet (*Ligustrum*), and Yellow-rumped Thornbills may use such areas for feeding and also, perhaps, for nesting.

## General Habits

The various members of the Acanthizidae range from the well-studied species, such as the White-browed Scrubwren and the Buff-rumped Thornbill, to almost unknown species, such as the Biak Gerygone, the Rufous-sided Gerygone, the Bicoloured Mouse-warbler and the Perplexing Scrubwren. This situation applies equally in Australia, where there are quite large gaps in our knowledge of even such widespread species as the Fairy Gerygone, the incubation and fledging periods of which remain unknown. Much is still to be learnt of the natural history of most acanthizids, particularly in New Guinea, with variable breeding systems a feature of some species, such as thornbills.

Despite their small size and dull plumages, many of the family are quite conspicuous as a result of their having obvious songs and calls, or because of their habit of associating with very active feeding flocks. Perhaps the most cryptic are the mouse-warblers, which are often very vocal but very skulking in the dense habitat in which they live; this makes it hard to see them well. Conversely, species such as the White-browed and Yellow-throated Scrubwrens often forage around picnic sites, where they can become tame and confiding.

Most members of the family occur in pairs or in small family groups, although some have a complex co-operative breeding strategy at times (see Breeding). The majority, if not all, maintain breeding territories, the males advertising their presence and availability for mating by means of songs and calls. Buff-rumped Thornbills have a distinctive strategy and maintain a clan-based home range throughout the year, dividing it into separate breeding territories in the summer.

Some acanthizids will gather into quite large flocks, with mixed thornbill flocks of up to 100 individuals observed in key feeding areas during the winter months. Some are core members of mixed-species foraging flocks, examples being the Large and Buff-faced Scrubwrens in New Guinea and the Large-billed Scrubwren in Australia. Gerygones, too, are inveterate joiners of such flocks, and most or, probably, all of them will utilize this method of foraging.

Agonistic displays are poorly known for the family as a whole. Pilotbirds and White-browed and Yellow-throated



Scrubwrens defend their breeding territories by means of singing, calling, chasing and, if necessary, actual conflict involving physical contact. Speckled Warblers perform all of these actions and may even grapple with an intruder, using their legs and bill to strike at the rival. A low-intensity display by this species involves one bird displacing another from a perch by flying or hopping at it. The territory-occupier may face an intruder and sing frantically, holding the crown feathers erected, the wings lowered and the tail raised.

White-browed Scrubwrens sing loudly and, while giving twittering calls, chase intruders at territory boundaries. They also have an aggressive display in which they bow rapidly to the left and the right and advance towards an opponent; the feathers are puffed out in order to expand the apparent size of the bird and to make the facial markings more prominent. Curiously, in the midst of such a dispute, individuals will sometimes freeze and give a low creaking call.

Shy (*Hylacola cauta*) and Chestnut-rumped Heathwrens (*Hylacola pyrrhopygia*) are very wary at times and can run extremely rapidly around an intruder, looking like mice as they scurry past and circle around, becoming bolder if the threat does not abate. Striated Fieldwrens become very difficult to flush and they run mouse-like through the vegetation or hop away; they have been seen to seek shelter in stone walls in one area. The Rufous Fieldwren cocks its tail and hops rapidly away, or it may run swiftly with the tail held horizontal. In the far south of Australia, this species has been noted as taking refuge down rabbit (*Oryctolagus*) burrows on the Nullarbor Plain.

Unlike many of the family, the Grey Gerygone is quite well known in terms of its general behaviour. Many of its agonistic displays consist of singing to advertise territory ownership, although males will also fight to defend the territory, and such battles can be protracted, with females known to join in. They also perform a spiralling flight up above the canopy, followed by chasing. The displays of other gerygones are not so well known, but singing by the male to advertise territory is frequent, and intruding species may be chased.

Similarly, thornbills generally chase away intruding neighbours during the breeding season, and aggressive displays by the Brown Thornbill involve fanning of the tail, exposing of the chestnut rump, drooping of the wings and raising of the crown feathers. The closely related Inland Thornbill is much more given to tail-cocking. Thornbills, scrubwrens and gerygones will mob predators such as owls (*Strigiformes*), butcherbirds (*Cracticidae*) and snakes.

Some limited information is available on the roosting behaviour of some members of the family. The Rockwarbler's roosting habits are little known, but young of this species have been found roosting under a rock shelter by the nest. Yellow-throated Scrubwrens roost together or separately on horizontal perches in dense cover, and sometimes in old or newly built nests, going to roost about 15 minutes before last light in summer and 15–25 minutes before nightfall in winter. Little is known about the roosting behaviour of the White-browed Scrubwren, but individuals seen to fly into holes formed under snow were thought to have roosted there. It seems likely that the female of this species roosts on the nest at night during the egg and nestling stages of the breeding cycle, and the same probably applies to all members of the family. Speckled Warblers have been seen to roost in fairly open situations, usually near the trunks of trees, the juveniles huddling close together. Young Weebills are known to use the nest for roosting for some days after fledging. The Shy Heathwren and the Redthroat occasionally sing at night, but no other details of their nocturnal behaviour are available. Brown Thornbills often roost as pairs in the understorey of their territory, the female staying on the nest at night during the breeding season. As with the White-browed Scrubwren, this species has been recorded as apparently roosting in hollows beneath snow. A party of about twelve Chestnut-rumped Thornbills was found at roost in a bluebush clump in June, during the non-breeding season, and a pair of this species roosted low down in a vegetation tangle in dense mulga woodland.

Buff-rumped and Yellow-rumped Thornbills brood their young overnight, which is likely to be the case for all of the



For birds inhabiting dense, low vegetation, the surrounding plants muffle sound, preventing it from carrying to the borders of a territory. The solution is simple, as this **Striated Fieldwren** demonstrates: sing from atop a shrub or bush so that your voice rings out, unimpeded, across a wider area. The Striated Fieldwren's song is a cheerful, loud, whistled phrase, musical yet rattly. Unlike some other acanthizids, it does not mimic other birds. The Striated Fieldwren sings predominantly in the breeding season, and often with its tail cocked. Unlike the Rufous Fieldwren (*Calamanthus campestris*), the Striated shows no geographical variation in vocalizations.

[*Calamanthus fuliginosus* albiloris, Werribee, Victoria, Australia. Photo: Peter Fuller]

Acanthizidae but is seldom documented. The male of the latter species roosts nearby, and is sometimes found sleeping in the false nest-chamber attached to the main nest (see Breeding). During the non-breeding season, members of a Striated Thornbill clan roost together, sometimes forming a huddle, with adults on the outside around the juveniles. Individuals have been observed to fly at dusk to deep cavities in snow gums (*Eucalyptus pauciflora*), a likely roost-site. One intriguing winter-season record from New South Wales in May involved about 17 Striated Thornbills packed tightly together on a branch on a cold day, with a further five trying to force their way in to the group by running along the backs of the huddled birds. In contrast, the Southern Whiteface roosts as pairs at times, the partners snuggling together in small shrubs.

Drinking has been little reported for acanthizids, and is a very poorly known phenomenon. White-browed Scrubwrens have been observed while drinking from water troughs in mallee heath and in gardens. Brown, Yellow-rumped and Striated Thornbills have been seen to drink from shallow bowls on hot days, but not on cooler ones, and it is likely that their diet usually supplies adequate moisture. None of the whiteface species has been reported to drink, but perhaps their seed diet gives them enough liquid. Nothing has apparently been noted with regard to drinking by the gerygones, and it may be that, again, these species obtain enough moisture from arthropod prey to make this unnecessary. It could be that, during gleaning, the birds can acquire moisture from dew, too, although this has not been reported or, at least, the possibility has not been fully investigated.

Bathing is an equally poorly known activity of the Acanthizidae, and is unknown for most of the species, although the Brown, Yellow-rumped and Striated Thornbills and the White-browed Scrubwren are reported as bathing regularly at sprinklers and birdbaths. Pilotbirds have been watched as they bathed in shallow pools, and, during rain, have been seen to fly through wet vegetation while holding the feathers erect and calling. The latter activity may be some sort of feather maintenance, but it could be associated with display. In addition, the Pilotbird has

been noted on warm days as making hollows in the ground and then flapping the wings so as to throw dirt over the back, before vigorously shaking itself. One male was watched while sun-bathing: it adopted a posture with the body flattened, the neck stretched and the wings spread, and held the feathers of the neck and back raised.

The Chestnut-breasted Whiteface often suns itself on cold morning and evenings in the desert, where it spends the hottest part of the day in a shady bush. Chestnut-rumped Thornbills, too, may rest in shade when temperatures are at their highest. The Southern Whiteface has been recorded as sheltering during the heat of the day in the burrow of a southern hairy-nosed wombat (*Lasiorhinus latifrons*).

## Voice

P. A. Gilbert, who studied the Chestnut-rumped Heathwren near Sydney, rated the species as one of the sweetest and most melodious of all the Australian songsters. His account is worth repeating:

"...beginning softly, the song will gradually swell in volume till the air rings with melody. At first it may sound like a full-voiced canary [*Serinus canaria*], or it may seem like a polished Sky-lark [*Alauda arvensis*], till a better understanding convinces you that you have not heard the song before... A beautiful songster appeals to even the most casual listener. What would be his admiration for the rendering of a bird which graciously weaves the songs, calls and alarm notes of other birds into his own sweet song? The heath-wren does this, for he is a song-mimicker of the highest attainments."

The famous ornithologist A. H. Chisholm listed 56 species of Australian bird known to mimic others, and considered the Chestnut-rumped Heathwren second only to the Superb Lyrebird

The Acanthizidae feed primarily on invertebrates, especially insects.

The Inland Thornbill is typical, foraging for spiders, beetles, bugs, ants, wasps and caterpillars. Like some of its congeners, it also consumes seeds.

The Inland Thornbill forages in pairs or presumed family parties of up to six birds, in loose groupings of up to 25 birds, or as part of many a mixed-species flock, particularly outside the breeding season.

Where it occurs sympatrically with other acanthizids, available food resources are partitioned, the Inland Thornbill feeding in higher bushes and shrubs, for example leaving the ground to the

Chestnut-rumped Thornbill (*Acanthiza uropygialis*) and logs to the Redthroat (*Pyrrholaemus brunneus*).

[*Acanthiza apicalis albiventris*, Flinders Range, South Australia, Australia. Photo: Peter Fuller]







The **White-browed Scrubwren** is an adaptable forager. It prefers to make use of its strong legs by moving in short hops on the ground, often in or below dense vegetation. However, it is also happy feeding arboreally, climbing trunks into the canopy of small trees in order to locate arthropods, seeds or fruit. The White-browed Scrubwren is one of several acanthizids that associate with larger birds scratching in the leaf litter. Sometimes in the company of a Pilotbird (*Pycnoptilus floccosus*), it will follow a lyrebird (*Menura*), foraging in areas where the lyrebird has disturbed the substrate.

[*Sericornis frontalis*  
*harteri*,  
Werribee, Victoria,  
Australia.  
Photo: Peter Fuller]

(*Menura novaehollandiae*) as a master mimic. The average number of species copied by one individual heathwren is probably about 15, but in the Sydney heaths some 37 species have been recorded as being imitated by this species, as opposed to 26 by the lyrebird. Interestingly, the Chestnut-rumped Heathwren's sibling species, the Shy Heathwren, is not quite so good a songster and indulges in mimicry much less often.

In 1970, A. R. McGill wrote, in his publication *Australian Warblers*, that *Gerygone* is one of the most aptly given of all generic names, meaning "born of sound" or "born of song", the word itself derived from a poem by the ancient Greek Theocritus. The characteristic songs of many gerygones are often the first indicator of their presence, and many people gain great aesthetic pleasure from hearing the singing of these acanthizids. The Western Gerygone certainly made a big impression on visiting English ornithologist A. Bell, who poetically described its vocalizations after hearing them in Perth, in Western Australia, where the species is a characteristic songster of the parks and gardens in spring and summer. In Bell's words, "I have never heard sounds so plaintively microscopic, so clear and yet scarcely perceptible. The ghost of a kitten's mew – the echo of dwarf violins played in the moon – these were the bird's notes."

The Redthroat is known for its beautiful song, and it is a skilled mimic, one individual incorporating the notes of a Pied Butcherbird (*Cracticus nigrogularis*) perfectly into its song. The New Guinea acanthizid species include two remarkable mimics in the Rusty (*Crateroscelis murina*) and Mountain Mouse-warblers, which pick up song phrases from other species and incorporate them into their own repertoires. It is often by no means apparent that what one is hearing is in fact mimicry. Sometimes the true circumstances are revealed only by the out-of-context situation, such as hearing what sounds like a Hooded Cuckoo-shrike (*Coracina longicauda*) calling from down in the undergrowth. It is not yet known if the Bicoloured Mouse-warbler mimics the sounds of other species.

Among the thornbills, the Brown Thornbill is one of the best mimics. Its mimicry is well known, mixing calls of many species

within its own song, and often given in "Whisper song", too. Species mimicked include the Eastern Yellow Robin (*Eopsaltria australis*), the Superb Fairy-wren (*Malurus cyaneus*), the Eastern Rosella (*Platycercus eximius*), the Brown Treecreeper (*Climacteris picumnus*), the White-eared Honeyeater (*Lichenostomus leucotis*), the Golden Whistler (*Pachycephala pectoralis*), the Grey Fantail (*Rhipidura albiscapa*), the Dusky Woodswallow (*Artamus cyanopterus*) and even a captive Island Canary (*Serinus canaria*). Other thornbills, including the Western, Chestnut-rumped, Yellow-rumped and Inland Thornbills, are reported as practising mimicry, but much less often than does the Brown Thornbill and with far less varied a selection of species imitated. The closely related Tasmanian Thornbill, however, is not known to be a mimic.

Most of the scrubwrens are not mimics, although some songs of the White-browed Scrubwren are so similar to songs of the Eastern Spinebill (*Acanthorhynchus tenuirostris*) and the Eastern Yellow Robin that it is hard to decide whether or not mimicry is involved. The exception is the Yellow-throated Scrubwren, which is known as a very skilful mimic. The range of species imitated by this acanthizid may approach or exceed that of the Superb Lyrebird. One party of four Yellow-throated Scrubwrens near Sydney was heard to mimic 26 other species during a period of about 30 minutes, the imitation of the disyllabic lyrebird call described as being "startling in its intensity for such a small bird". A caged canary barely within earshot was mimicked by this species, but this vocal copying ceased soon after the canary was moved away.

None of the gerygones is known as a mimic, but, as already indicated, the genus does contain some fine songsters. The Mangrove Gerygone has been called the "Queensland Canary", an allusion to its frequent bursts of sweet song, while the song of the Western Gerygone may have a somnolent quality and the bird has been called "Sleepy Dick" or the "Psalmist".

The Pilotbird has a loud sweet ringing call very similar to that of the Eastern Bristlebird (*Dasyornis brachypterus*), but it is not a mimic. The Rockwarbler, on the other hand, is known to

An unobtrusive inhabitant of the shady forest floor of north-east Australia, the **Fernwren** forages either singly or in pairs. Rather recalling a long-billed, short-tailed *Sericornis* scrubwren, the Fernwren busies itself among damp leaf litter or fallen wood, gleaning, scratching or probing for food. In its search for arthropods or small skinks, the Fernwren may bury itself in leaves or throw them into the air.

Like some other acanthizids, the Fernwren often takes advantage of the foraging of other species, notably the **Orange-footed Scrubfowl** (*Megapodius reinwardt*) and **Chowchilla** (*Orthonyx spaldingii*). It picks off insects unearthed by the larger birds during their terrestrial scratching.

[*Oreoscopus gutturalis*, Mt Lewis, NE Queensland, Australia.

Photo: Hans & Judy Beste/Lochman Transparencies]



imitate the Pilotbird and some other forest birds, such as the Grey Fantail, the Grey Butcherbird (*Cracticus torquatus*) and the Rufous Whistler (*Pachycephala rufiventris*). Unlike heathwrens, the fieldwrens are not mimics, but the Speckled Warbler is a versatile mimic, noted as copying a wide range of species. Although it has been claimed that the Fernwren imitates the sounds made by other bird species, this requires confirmation.

One curious feature has been reported by ringers in respect of three species. It appears that the Western Gerygone, the Brown Thornbill and the Speckled Warbler, when being handled, often sing a quiet little song.

Apart from their songs, the members of this family have a range of calls. These are generally unremarkable. Various squeaks, whistles and chatters are uttered by many of the species, and harsh single or repeated notes are given. Some emit a harsh rattling series of notes as a scold or when alarmed.

### Food and Feeding

Members of this family feed primarily on invertebrates, especially insects, with spiders (Araneae) and snails (Gastropoda) taken usually in lesser numbers. Beetles (Coleoptera) often figure prominently in the diet, but bugs (Hemiptera), ants (Formicidae) and lepidopteran caterpillars are also eaten frequently. As noted previously (see Morphological Aspects), the Weebill has a short stubby bill and this is ideal for feeding on lerp insects, an important prey item of this species. Striated Thornbills are recorded as taking "manna", a secretion from lerp insects living, in this instance, on the manna gum (*Eucalyptus viminalis*). The nymphs of these sap-sucking plant lice secrete copious amounts of a honeydew-like liquid which, when dried, forms what is termed "lerp", or manna.

Although the food of most acanthizids is predominantly invertebrates, some of the species occasionally eat seeds and fruits, too. Indeed, the whitefaces are adapted to consume large quantities of seeds, this specialization being reflected in the stout stubby

beak possessed by all three species. Within Australia, some exotic plant species have become significant food sources for a variety of species. In the case of the Acanthizidae, the fruits of both lantana and blackberry may be eaten at times by gerygones and scrubwrens, while the Pilotbird is known to take seeds of *Rubus* and *Rosa* species. No member of the family seems to be unduly specialized on the seeds or fruits of any one particular plant species or plant group.

Striated Thornbills and other acanthizids can fall foul of more aggressive species such as the nectarivorous Red Wattlebird (*Anthochaera carunculata*), Noisy (*Manorina melanocephala*) and Bell Miners (*Manorina melanophrys*) and Fuscous (*Lichenostomus fuscus*) and White-naped Honeyeaters (*Meliphreptus lunatus*), which will guard a food source such as a flowering tree and drive off other species, even if those species may be exploiting insects, rather than nectar. It is not certain how important nectar is for thornbills, but various species have been reported at flowers and it is likely that nectar is an at least occasional dietary supplement. The Western Thornbill seems to take nectar regularly, and this could be an adaptation to the unusually rich and diverse flora in Western Australia, where the thornbill lives.

An item that figures in the stomach contents of many of the more terrestrial acanthizids is grit. It is not certain, however, whether this has any function in the digestive process or whether it is simply ingested incidentally when the bird is taking prey.

The terrestrial species all move around by hopping, some, such as the Pilotbird and the Yellow-throated Scrubwren, having unusually large legs and feet as an adaptation for scratching a living among the leaf litter. Yellow-rumped Thornbills feed on the ground, where they hop about on grass, soil or gravel in search of insects and some seeds. The more arboreal species, the majority of the family, feed mainly by gleaning small invertebrates from foliage or twigs and branches, some, such as the Large-billed Scrubwren, working their way up trunks. Several of the Acanthizidae incorporate more active methods into their foraging repertoire. For example, sallying and hovering are used as





Passerines generally have to spend most of the day foraging in order to find sufficient food to meet their energy needs. Acanthizids use a variety of foraging methods, depending on their preferred prey and stratum. But whatever method is chosen, a sharp pair of eyes is essential, to detect the tiniest of movements or, harder still, to spot cryptically camouflaged. This **Yellow Thornbill** has clearly spied a meal and then captured it. The Yellow Thornbill is almost entirely arboreal, usually foraging in the canopy or subcanopy, though there is some evidence that it frequents lower strata outside the breeding season. It uses a wide variety of trees and shrubs, favouring acacia, cypress pine, casuarina and paperbark, and while its preferred substrate is foliage, it will also forage on bark. It catches most of its prey by gleaning, but will also sally. Small feeding groups of up to five birds are the norm, but monospecific flocks of up to 35 birds have been recorded. The Yellow Thornbill is also a regular member of mixed thornbill flocks that also include the trio of "rumped" thornbills, namely the Yellow-rumped (*Acanthiza chrysorrhoa*), Buff-rumped (*A. reguloides*) and Chestnut-rumped Thornbills (*A. uropygialis*).

[*Acanthiza nana modesta*,  
Lara, Victoria, Australia.  
Photos: Peter Fuller]

As this photograph aptly illustrates, the **Large-billed Scrubwren** has an extraordinary form of foraging behaviour, in that it often hangs upside-down while feeding in trees. Even more frequently, this species spirals up trunks in a manner that recalls an Australasian treecreeper (Climacteridae), calling constantly as it gleans arthropods from foliage and bark. This distinct ecological niche enables it to avoid competition with two sympatric congeners, the **Yellow-throated** (*Sericornis citreogularis*) and **White-browed Scrubwrens** (*S. frontalis*).

[*Sericornis magnirostris*  
howei,  
Badger Creek,  
Healesville, Victoria,  
Australia.

Photo: Andy & Gill Swash]



foraging strategies by the Weebill and by most of the gerygones and thornbills. Occasionally, acanthizids immobilize insects by holding them under the feet.

To some extent, sympatric species partition habitats, albeit with occasional overlap, by utilizing different micro-habitats or niches. Among three congeneric and sympatric thornbills, the Striated Thornbill gleans primarily from foliage in the canopy and subcanopy, whereas the Brown Thornbill forages among shrubs and the middle stratum, and the Buff-rumped Thornbill feeds from the ground or bark as well as in the mid level. In drier country, Chestnut-rumped Thornbills spend a lot of time in foraging on the ground, while Inland Thornbills feed higher in bushes and shrubs and the Redthroat spends more time in bushes and fallen timber. Each of the three species exploits a slightly different niche from those of the other two and, probably, takes significantly different prey items from among the arthropods of each micro-habitat.

White-browed, Large-billed and Yellow-throated Scrubwrens co-exist in many areas of the eastern seaboard of Australia, but they have distinct foraging methods and no doubt differ somewhat in their diets. Unfortunately, the dietary preferences of many species, particularly those of New Guinea, are poorly known.

Several species of acanthizid have strong associations with other, larger birds that scratch among the leaf litter. The most renowned is the Pilotbird, which has a well-known but seemingly rather seldom seen association with the Superb Lyrebird, foraging among the scrapings of that species on the forest floor. The name of "Pilotbird" may derive from this, or from times in the past when the species was used by bushmen to guide them to the larger and tastier lyrebird. The related Albert's Lyrebird (*Menura alberti*) has a loose association with two scrubwrens, the Yellow-throated and sometimes the White-browed Scrubwrens foraging among the scratchings both of this species and of the Australian Logrunner (*Orthonyx temminckii*). In tropical north Queensland, the Chowchilla (*Orthonyx spaldingii*) is a similar scraper of the dark shady forest floor, and here the cryptic Fernwren is quite often a close associate of it, following the small family parties of the larger bird and feeding from among their scrapings. Similarly, the scrapings of the Orange-footed Scrubfowl (*Megapodius reinwardi*) may be exploited by both the Fernwren and the Yellow-throated Scrubwren.

Some members of the family are core members of mixed-species feeding flocks, associating with a wide range of woodland passerines. In the tropical north of Australia, Fairy Gerygones, Brown Gerygones and Large-billed Scrubwrens are common constituents of such flocks, feeding with Grey and Rufous Fantails (*Rhipidura rufifrons*), Eastern Yellow Robins, Grey Whistlers (*Pachycephala simplex*), Spectacled (*Monarcha trivirgatus*), Black-faced (*Monarcha melanopsis*) and Pied Monarchs (*Arses kaupi*) and a variety of other species. These associations seem more prevalent outside the breeding season, but they occur throughout the year, the various species using separate niches and, presumably, eating largely different prey species within the habitat. In the hill forests of New Guinea, the Yellow-bellied Gerygone is a core member of mixed flocks inside the forest, where Chestnut-bellied Fantails (*Rhipidura hyperythra*), Spot-winged (*Monarcha guttula*) and Frilled Monarchs (*Arses telescopthalmus*), Hooded Pitohui (*Pitohui dichrous*) and, sometimes, the Pale-billed Scrubwren, Wallace's Wren (*Sipodotus wallacii*) or the Raggiana Bird-of-paradise (*Paradisaea raggiana*) are in attendance. On the forest edge the Green-backed Gerygone (*Gerygone chloronota*) assumes a similar role, while the Fairy Gerygone can occur with either assemblage.

In the highlands of New Guinea, the various *Sericornis* scrubwrens are often components of mixed-species foraging flocks, with usually two species overlapping at any one site. Precisely which species are involved depends on altitude. At the higher elevations, from 1500 m upwards, the Large and Papuan Scrubwrens meet, the latter being smaller and often feeding somewhat higher in the trees and shrubs. Habitat-partitioning has not been well studied here, and details of the diet of most species are very poorly known, but structural, foraging and, presumably, dietary differences enable the co-existence of congeners. At the middle elevations the Large and Buff-faced Scrubwrens often overlap, coming into the range of the Grey-green Scrubwren at lower altitudes and again successfully co-existing through niche segregation.

A further example of this occurs among the little-known *Crateroscelis* mouse-warblers of New Guinea, where in some areas all three species have been recorded within the same altitude band, around 1520–1580 m. The Bicoloured Mouse-warbler may be a rather rare relict species, being squeezed out by competition from its congeners, the Rusty and Mountain Mouse-





The **Yellow-rumped Thornbill** is primarily a terrestrial species, small groups moving about on the ground in a series of hops or striding around like a miniature pipit (*Anthus*). This species readily feeds on a variety of terrestrial substrates, from bare ground to leaf litter and from grass to fallen branches. Where conditions are suitable, it will also feed in the shrub layer, and even ascend to the subcanopy where this is relatively low. Like its congeners, the Yellow-rumped Thornbill is on the search mainly for arthropods, particularly ants, beetles and bugs, as well as for seeds.

[*Acanthiza chrysorrhoa leighi*,  
You Yangs, Victoria,  
Australia.  
Photo: Peter Fuller]

warblers, but the overlap range seems quite extensive. No doubt some unknown ecological niche is being utilized, the Bicoloured Mouse-warbler perhaps feeding higher in the vegetation as a way of partitioning the food resources. This is a matter well deserving of future research.

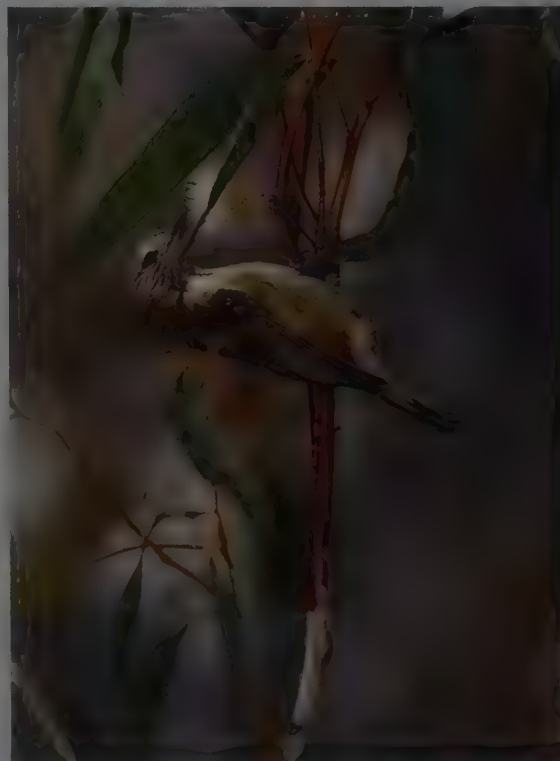
## Breeding

Until recently, studies of the breeding biology of passerines have been heavily biased towards the Northern Hemisphere species, but recent investigations in the southern half of the globe have been revealing and have altered our perceptions of what is the norm. Adaptations to different environments, where food may be scarce or, conversely, very abundant, result in very different breeding strategies. Species in the Australian corvid group (see Systematics) have smaller clutch sizes than those of passerines that breed at similar latitudes in the Northern Hemisphere and those of Australian members of the "parvorder" *Passerida*. It is postulated that Australian species from the "Old Endemic" *Corvida* assemblage have a slow reproduction rate, with small clutch sizes, long periods of parental care and extended breeding seasons. The family *Acanthizidae* exhibits considerable variety in terms of breeding strategies, but in broad terms it fits quite neatly into this category.

Various breeding strategies are adopted by acanthizids. These range from breeding as simple pairs, as illustrated by the Pilotbird, the Rock-warbler, the Fernwren, the Scrubwren, the Heathwrens, the fieldwrens and the Large-billed and Buff-faced Scrubwrens, to co-operative breeding, which is quite frequent with the Weebill, the White-browed Scrubwren and the Buff-rumped and Striated Thornbills. Co-operative breeding, with helpers at the nest, is suspected at times for Yellow-throated and Tasmanian Scrubwrens but is not the norm for these species; similarly, it occurs occasionally among Yellow-rumped, Yellow, Chestnut-rumped and Western Thornbills and is suspected for Papuan, Mountain and perhaps Slender-billed Thornbills. There are suggestions that co-operative breeding may result in better fledging success in certain environments where resources may be scarce or erratic. On the other hand, it is not so effective in richer environments where food is usually more plentiful, as in temperate and tropical rainforests. The Brown, Rufous and Tasmanian Thornbills nest as simple pairs, as probably does the poorly known Slaty-backed

Thornbill. Each species no doubt develops its own response to conditions over time. It is thought that co-operative breeding may be the ancestral state in the subfamily *Acanthizinae*, pair-breeding having evolved on two separate occasions among the thornbills.

The well-studied Buff-rumped Thornbill exhibits the most complex system among the thornbills. It often forages as clans of 10–20 individuals in tight groups, within all-purpose clan territories. As the breeding season approaches, each clan breaks up into smaller groups; these divide the clan territory into separate breeding territories, which they defend against groups of the same



Like other acanthizids, the **Striated Thornbill** feeds mainly on arthropods and seeds, but, unusually, it also feeds on honeydew-like "manna". This is a secretion from lerp insects (*Psyllidae*), plant lice that suck the sap of gum trees (*Eucalyptus*). The bird seen here appears to be scouring a flowering eucalypt for insects that might have been attracted. The Striated Thornbill tends to feed in the canopy and subcanopy, a preference that enables it to occur sympatrically with two congeners, the Brown Thornbill (*Acanthiza pusilla*) and the Buff-rumped Thornbill (*A. reguloides*), which feed in lower strata.

[*Acanthiza lineata lineata*,  
Mount Ida, Heathcote,  
Victoria, Australia.  
Photo: Andy & Gill Swash]

Using its strong legs and feet to hop along the shady forest floor, the **Yellow-throated Scrubwren** is an opportunistic forager. Most of the time it gleans for insects, fruit, seeds and fungi, but it also searches more methodically by probing and scratching the ground. This scrubwren also feeds sneakily in the slipstream of larger terrestrial birds such as the Orange-footed Scrubfowl (Megapodius reinwardt) and Australian Logrunner (Orthonyx temminckii). The scrubwren waits for these species to scratch the surface, then moves in to see what insects have been coaxed out of their hiding places.

[*Sericornis citreogularis intermedius*, Lamington National Park, Queensland, Australia. Photo: Marie Read]



and other clans. Clan territory size is about 13–15 ha in New South Wales. A clan that trespasses into another territory will, when discovered, fly up and over the woodland canopy as a tight flock and return to its own territory. Breeding groups consist of 2–4 individuals, the figure increasing to 4–6 in summer with the inclusion of the fledged young. Groups consist of a female and from one to three males, only one of which breeds; only the female incubates, and she is probably also the one that builds the nest. The nestlings are fed by both parents and by any helpers present. Failed breeders may help to feed the fledglings of successful nesters. When nesting is over, young females disperse or

are evicted, and are then recruited into neighbouring clans, but males seem to stay with the parental clan. In New South Wales, a complete breeding cycle, from nest construction to fledging, took 6–10 weeks. Breeding groups and young merge into clans around January–February.

Another well-studied acanthizid is the White-browed Scrubwren. In Western Australia, co-operative breeding by this species is most frequent in semi-arid areas and least common in arid environments. Helpers make significant contributions to the feeding of nestlings and to nest hygiene, and there is a tendency for chicks in such nests to fledge a day or two earlier than those raised by pairs alone. This may be advantageous if conditions become unfavourable. White-browed Scrubwrens in more arid environments experience higher mortality, perhaps because they suffer exhaustion, and their food supplies become depleted, after breeding attempts in harsh summer conditions. This may mean less competition for breeding space and, consequently, less need for a co-operative breeding strategy.

In most co-operatively breeding bird species, subordinates help the dominant pair to provision the young, regardless of the origin of the group and the relatedness among its members. Within the Acanthizidae, there is considerable variation in social organization and parental behaviour. Some clans of group-living species in this family are made up of kin, and subordinates assist in the provisioning of the young. Speckled Warblers are different in that the offspring are never philopatric (site-faithful), and breeding groups are made up of unrelated individuals. Speckled Warblers breed as pairs or as trios, the latter consisting of a female with two males. Aggressive “alpha” males are socially dominant over “beta” males, which never help to feed young, even though they compete for mating. The social system of this species is unusual in being polyandrous but not co-operative. In addition to competing for mating with females on their own territories, beta males, as well as single males that had lost their breeding partner, regularly undertake extra-territorial forays, usually in the period when the neighbouring female is fertile.

Many members of the family are relatively poorly known. Few details are available on the mouse-warblers of New Guinea, for example, but it seems likely that they breed as pairs. Although the Southern Whiteface nests in pairs, it also breeds communally and co-operatively at times. The two other whiteface species have

The **White-browed Scrubwren** is known to display when a predator threatens its eggs or young. To distract the intruder, an adult will either feign a broken wing or flick its wings and tail and sway its body from side to side, typically while sat atop a prominent perch. This species is one of a handful of acanthizids that often breed co-operatively. Helpers feed the young and keep the nest clean. This assistance enables pairs to fledge young a day or two earlier than normal. Such a breeding strategy is most frequent in semi-arid conditions, and least so in arid areas.



[*Sericornis frontalis harterti*, Badger Creek, Healesville, Victoria, Australia. Photo: Andy & Gill Swash]



been recorded as nesting in pairs, but there is little information on their reproductive behaviour.

The main breeding season is during the spring and summer months, from July through to January, although the Southern and Banded Whitefaces and the Yellow-rumped Thornbill appear to be more opportunistic, nesting at virtually any time of the year when conditions are suitable. The New Guinea acanthizids, too, seem to breed almost throughout the year, in both dry and wet seasons, but detailed data from this region are lacking.

Acanthizids generally build domed nests of vegetable stems and fibres, often lining the interior with feathers. These nests sometimes have a hooded side entrance, and they include some odd adaptations. The Rockwarbler of New South Wales suspends its domed nest from a cave wall or roof, an overhang, a rock face or a bridge or building, narrowly attached to the site by spider webs, which the bird wedges into place by using its bill; the nest is reportedly also covered with a binding secretion, probably saliva. Pilotbirds build untidy globular nests, usually well hidden and placed low down, where they are camouflaged such that they look like forest debris. Fernwrens choose overhangs or hollow logs for their quite large domed nests, again well camouflaged in the gloom of the forest understorey. The Yellow-throated Scrubwren builds a large domed nest that is often hanging in a conspicuous site over a track or stream, where it can resemble flood detritus caught on branches. This species is frequently exploited by the Large-billed Scrubwren, which has a habit of taking over its nests, whether new or disused ones. Brown Thornbills have been reported to do the same, a curious case of opportunism among relatives. All of the scrubwrens appear to build domed nests, although the nests of the New Guinea species are either unknown or known from just a very few records. The Scrubtit makes a small spherical nest, often among, and using as material, dead tree-fern fronds, which in many places are a common feature of their habitat.

The heathwrens and fieldwrens construct domed or spherical nests, usually on or near the ground and well concealed, as are the domed nests of the Redthroat and the Speckled Warbler. Weebills, on the other hand, seem to do things a bit differently, starting with a cup and then adding the dome later, making a pendulous nest well hidden in dense foliage. These suspended nests are typical also for the gerygones, many nests of which



Display is a highly significant activity for most birds. Some species display to attract a mate or strengthen the pair-bond. Others display to defend their territory. Yet others display to distract predators from vulnerable eggs or young. The tail-fan display by this **Southern Whiteface** is probably aimed at the first reason. It is possible, however, that the rear bird is not a mate but a "helper" at the main breeding pair's nest, because this species has been known to breed co-operatively and may do so regularly.

[*Aphelocephala leucopsis leucopsis*,  
Yawah, Queensland,  
Australia.  
Photo: Graeme Chapman]

have a hooded side entrance and a hanging "tail" of vegetation below the structure, which may serve to camouflage it. The nests of Large-billed Gerygones are often over water and, like those of the Yellow-throated Scrubwren, can look like flood debris caught among the trees.

Domed nests are characteristic of the thornbills too, although the Mountain Thornbill suspends its tall oval nest in the outer foliage of a rainforest tree, well camouflaged with green moss, which trails below the nest and breaks up the outline. It is possible that the covering of moss may help to protect the nest from rain in this wet environment. One of the oddest of the group is that of the Yellow-rumped Thornbill. In this species, both sexes make a bulky and untidy nest with a domed egg-chamber; it has



Acanthizid nests are usually quite impressive constructions, generally comprising domes built of vegetable stems and fibres and containing a hooded side entrance. The lining, normally feathers, is the finishing touch. Judging by the contents of its bill, this **White-throated Gerygone** looks to be at that final stage. The nest of this species differs from that of most family members, in that it has a long, slender "tail". The nest hangs from the outer branch of a tree or shrub, 2–12 metres above ground. This gerygone is one of several congeners that gives its chicks a protective advantage against predators by housing its nest close to that of a wasp colony.

[*Gerygone olivacea olivacea*,  
Campbell Park Nature  
Reserve,  
Canberra, Australia.  
Photo: Peter Marsack/  
Lochman Transparencies]



Suspended nests are typical for gerygones.

The nest of this **Yellow-bellied Gerygone** is an ovoid, with a side entrance towards the top and a long "tail" dangling below.

The length may help camouflage the nest, making it resemble debris caught in the tree.

Composed of fibrous matter, the nest is bound with spider webs and lined with soft fibres.

The Yellow-bellied Gerygone has been recorded breeding in both the dry and wet seasons in New Guinea, but there is no evidence of it being double-brooded.

The species breeds as a pair, although an observation of four individuals feeding a fledgling has led to the suggestion that it may occasionally breed co-operatively. As with most acanthizids in New Guinea, the breeding biology of the Yellow-bellied Gerygone is otherwise poorly known. The clutch size is thought to be three, but there is no information at all on incubation, nestling period or parental care. This poor understanding of the acanthizid world is due in no small degree to the logistical difficulties of doing fieldwork in remote forests on this rugged island.

[*Gerygone chrysogaster*  
chrysogaster,  
Brown River,  
SE New Guinea.  
Photo: Brian J. Coates]



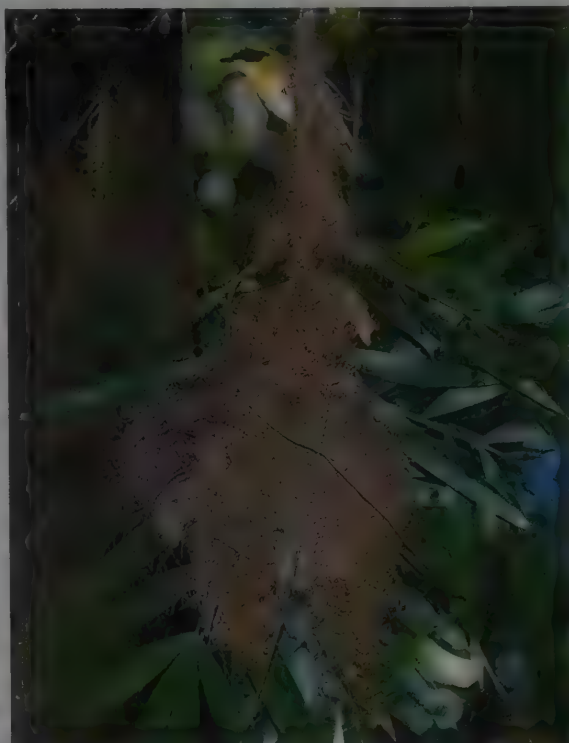


This **Grey Gerygone** is putting the finishing touches to its nest, lining the inside with feathers. The nest itself is roughly pear-shaped. It has a side entrance towards the top, with a hint of a hood to add protection. Some nests of this species have a dangling "tail", like those of some other gerygones but unlike most other genera in the family. To construct the nest, the Grey Gerygone pair collects rootlets and grass stems, weaving them together with moss, fur, ferns and bark. The adults bind the nest together with spider webs and then add the lining. The Grey Gerygone is usually monogamous and, like congeners, nests solitarily. The breeding season starts three months later in the south of its range than in the north, but is relatively protracted, sometimes allowing two broods to be raised. The usual clutch size is three or four. Only the female incubates, usually for just under three weeks. The female broods the chicks, and both members of the pair feed them, for a similar duration. Once they have fledged, chicks remain dependent on their parents for more than five weeks.

[*Gerygone igata*,  
New Zealand.  
Photo: ANTHONY]

The **Yellow-throated Scrubwren** is a cunning bird when it comes to breeding. Suspending its nest from vines or the outer branches of a tree, it often places it low over a watercourse. In such a location, and with its slim, pendulous structure, the nest looks rather like flood debris. As such, it has a good chance of eluding the attention of predators and the threat from a less expected quarter: the congeneric Large-billed Scrubwren (*Sericornis magnirostra*). The latter is notorious for ousting the smaller Yellow-throated Scrubwren from its breeding site, and taking it for its own.

[*Sericornis citreogularis intermedius*,  
Mt Glorious,  
SE Queensland, Australia.  
Photo: Brian J. Coates]



a side entrance, and has "false nests", variously cup-shaped, domed or partly domed, attached on the top or on the side. If renesting, the birds may utilize one of the false nests as an actual nest, so that clusters of up to five nests can occur, although no additional false nest is built for those so used. The function of the false nest is uncertain; among various suggestions put forward are that it is an "apprentice nest" for helpers, that it is designed to deceive predators or cuckoos (*Cuculidae*), that it serves as a roosting site for the male or the newly fledged young, and that it perhaps represents simply an extension of a strong building urge in males. The nests of this thornbill may be well

Domed nests are characteristic of the *Acanthiza* thornbills, but the nest of the **Mountain Thornbill** is a variation on the theme. The tall oval nest is suspended from the outer branches of a rainforest tree. While it is mainly built of fairly typical *Acanthiza* material such as grasses, vines and ferns, it is more heavily coated with moss than the nests built by congeners.

This moss has two purposes. Trailing below the nest, the moss breaks up its outline and thus helps in concealment. In addition, the use of this dense vegetation may help waterproof the nest, a distinct benefit in the Mountain Thornbill's wet rainforest environment.

[*Acanthiza katherina*,  
Atherton Tableland,  
N Queensland, Australia.  
Photo: Clifford &  
Dawn Frith]



insulated for colder weather, and the birds may also loosen the structure during the hot season, when temperatures can exceed 40°C. The male of this species continues to build while the female is incubating, and even during the nestling stage, often with helpers assisting in the work.

Compared with the other acanthizids, the whitefaces construct nests of a somewhat different type, as might be expected from their very different lifestyles. The Southern Whiteface's nest is a globular untidy structure with a side entrance, and is placed often in a hole in a tree trunk or branch, a cavity in a fence post, in low shrubs, or even in the large stick nest of a raptor. The Banded Whiteface makes an untidy spherical nest with a side spout, rather unlike the nests of other members of the family. The Southern Whiteface is known also to have taken over nests of the Zebra Finch (*Taeniopygia guttata*), as well as reusing old nests of that species. When it comes to usurping the nests of others, however, the most notorious member of the family is the Large-billed Scrubwren. This species strongly prefers to utilize the nests of the Yellow-throated Scrubwren, and it will summarily take over the latter's newly completed nests, as well as old ones.

Most of the species living in arid and semi-arid zones utilize a common environmental resource for nesting purposes. They make use of spider webs and the egg sacs of spiders in order to bind their nests and to decorate them. The Weebill and both the Buff-rumped and the Yellow-rumped Thornbills have been recorded as nesting in close association with the communal spider *Badumna communalis*, building their own nests right up against those of the spiders, which may have a protective function. Several of the gerygones are well known for having an association with wasp (*Hymenoptera*) nests, the White-throated, Mangrove and Fairy Gerygones sometimes building in close proximity to the nests of aggressive wasps. The White-throated Gerygone sometimes sites its nest close to that of green tree-ants, which presumably confers some sort of protective advantage against predators. As mentioned in the preceding paragraph, Southern Whitefaces are known to nest among the sticks of nests of raptors, such as the Wedge-tailed Eagle (*Aquila audax*) and the Whistling Kite (*Haliastur sphenurus*), and also those of corvids, again presumably deriving some protection from predators by means of this close association.

Before leaving the subject of the nests of this family, it is worth noting that two species of vespertilionid bat have been





While the main acanthizid breeding season is during spring and summer, the **Yellow-rumped Thornbill** is more opportunistic, nesting whenever conditions are suitable. This species strays the furthest from the normal *Acanthiza* nest norm of a dome. Its bulky nest has a domed egg-chamber, but would win no prizes for tidiness, being essentially a sprawling mess. Remarkably, it has "false nests", which may be cup-shaped or part-domed, attached on top or to the side. The function of these imposters is unclear, but theories abound: the dummy nests may serve as an "apprentice nest" for the helpers that assist this frequently co-operatively breeding species; they may be designed to throw predators or cuckoos (*Cuculidae*) off the scent of the real nest, an important potential function given that one study revealed that a quarter of Yellow-rumped Thornbill nests were parasitized by the Shining Bronze-cuckoo (*Chrysococcyx lucidus*); they may serve as roost-nests for the male or fledglings; or, simply, the abundance of nests may be the result of an excessive male nest-building urge. Indeed, the male, and helpers on occasion, continue construction even when the eggs have hatched and thus there is no further need of a nest.

[*Acanthiza chrysorrhoa* normantoni, Goomboorian, near Gympie, SE Queensland, Australia. Photo: Cyril Webster]



The **Chestnut-rumped Thornbill** often affords its brood extra protection by nesting inside in a tree cavity or, opportunistically, a hole in a wall, a water pipe or, in one memorable and slightly bizarre instance, the eye socket of a horse's skull. Such concealed sites decrease the chance of predation and parasitism, giving the young a head start in life. Nestlings sometimes also benefit from another facet of the species' breeding strategy, namely the use of helpers to provision the chicks. The consequent reduction of burdens on the core breeding pair is likely both to improve breeding success and increase the chances of raising more than one brood in a season; two broods are common, and three possible.

[*Acanthiza uropygialis*,  
Toganmain Station,  
New South Wales,  
Australia.

Photo: Graeme Chapman]



found roosting in the nests of Brown Gerygones and, curiously, also in the nest of a Fernwren. These incidents represent a seemingly strange and opportunistic use by the bats of a suitable forest shelter.

For those acanthizids for which relevant data are available, the clutch consists of two or three eggs in most cases, some thornbills sometimes laying four eggs. The eggs of almost all species are reported either as being mainly white, as are those of the Rockwarbler, the Fernwren and, sometimes, the Slender-billed and Yellow-rumped Thornbills, or as having variable patterns of dark speckles or spots, these usually forming a band of variable density around the larger end. Exceptions are the eggs of the Speckled Warbler, which are dark reddish-brown or purple-brown with a darker cap, and those of the Redthroat, which are almost uniformly dark greyish-brown to dark olive-brown, slightly paler towards the narrow end. The eggs of all the species are typically ovoid and lustrous. For many members of the family, however, especially those in New Guinea, the nest and eggs are unknown or virtually unknown.

The Australian species generally lay at 48-hour intervals, which is unusual for passerines. The incubation periods vary from 15 days to 21 days, and the duration of the nestling period, so far as is known, is 13–21 days. For the Western Gerygone, however, an incubation period of 10–12 days is recorded, with a similar nestling period. Fledglings are typically plain-plumaged, with little or no patterning. Data on the incubation and nestling periods appear to be lacking even for some relatively well-known species, such as the Fairy Gerygone and the Green-backed Gerygone. As a general rule within the family, the female incubates but both sexes help to feed the young, sometimes with helpers in the case of certain species.

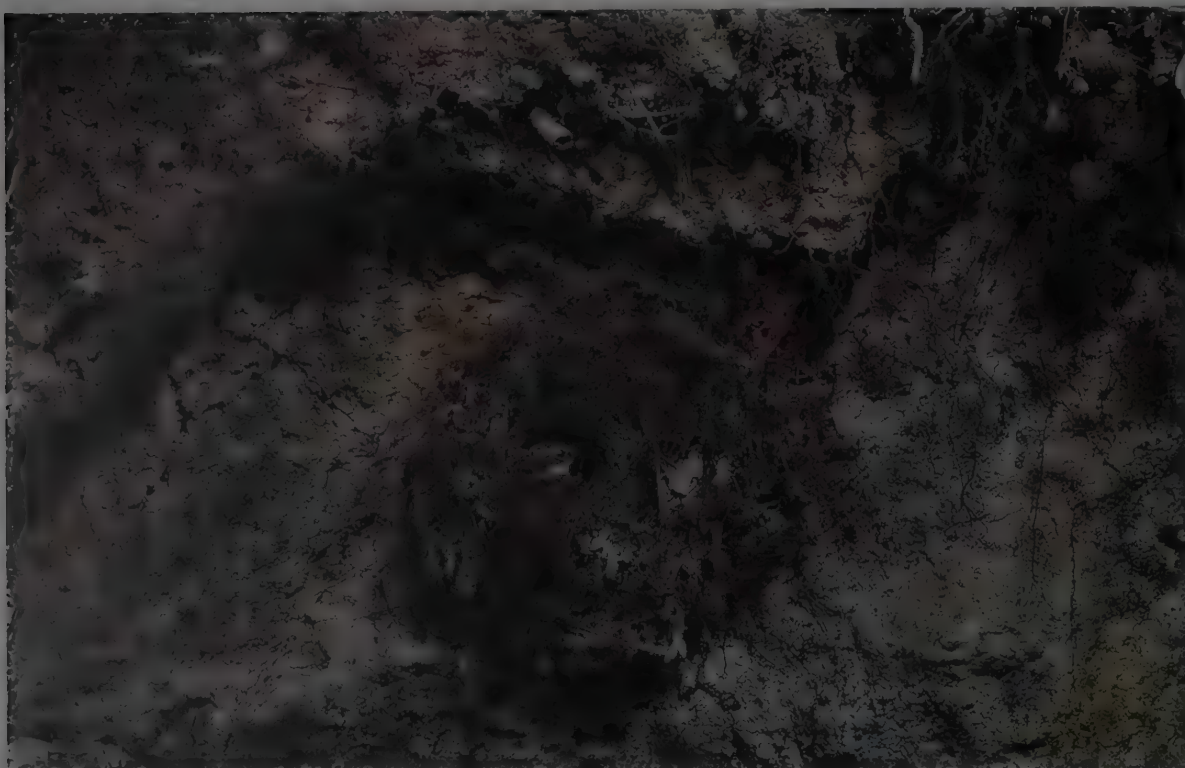
The White-browed Scrubwren has a distraction display whereby it droops the wings and runs around. In another display used to lure intruders away from the nest, the scrubwren perches atop tall shrubs, flicking its wings and tail while swaying the body, thereby emphasizing the wing and tail markings.

Predation is always a serious problem for small birds, and the statistics from the Australian Nest Record Scheme make for interesting study when enough is known to give an idea of nest

failure rates. Brood parasitism by cuckoos is another factor influencing the breeding success of these birds. At one study site, some 26% of the nests of Yellow-rumped Thornbills were parasitized by the Shining Bronze-cuckoo (*Chrysococcyx lucidus*), while at another the Brown Thornbills seemed to nest quite early and thus to avoid the unwelcome attentions of migratory Fan-tailed Cuckoos (*Cacomantis flabelliformis*), which arrived after the chicks were fledged, the cuckoo then exploiting only those thornbill pairs that had failed earlier. Large-billed Gerygones are frequent victim of parasitism by the bronze-cuckoos, especially the Little Bronze-cuckoo (*Chrysococcyx minutillus*), probably as their nests tend to be in very obvious situations. There are reports of acanthizid nests containing eggs laid by three different female cuckoos, with no host eggs left in the nest. Species such as the Laughing Kookaburra (*Dacelo novaeguineae*), the Pied (*Strepera graculina*) and Grey Currawongs (*Strepera versicolor*), the Pied and Grey Butcherbirds and many of the corvids are formidable nest predators, as also, of course, are many of the larger snakes and goannas (*Varanus*). Add to this mix rats (*Rattus*), cats, dingoes (*Canis dingo*) and foxes (*Vulpes*) and the odds seem to stack up against the smaller birds, the situation being exacerbated by adverse weather and human intervention.

One surprising feature to come out of the Australian Bird and Bat Banding Scheme (ABBS) is the longevity of some small passerines, among them several members of Acanthizidae. For example, a Brown Thornbill was retrapped 17 years and 5 months after it had first been ringed, and four Yellow-throated Scrubwrens were retrapped at, respectively, 16 years 8 months, 9 years 11 months, 7 years 10 months and 6 years 10 months. White-browed Scrubwren retraps or sightings were made at 16 years 2 months, 14 years 5 months and 14 years 4 months. It is estimated that about 10% of White-browed Scrubwrens ringed in Western Australia survive at least 6 years after ringing. The following figures, giving the interval between initial ringing and later retrapping of individuals, provide a further indication of the potential lifespan of these small passerines: Pilotbird 11 years 11 months, Fernwren 6 years 10 months, two Large-billed Scrubwrens 15 years 3 months, Tropical Scrubwren 9 years, Shy Heathwren more than





9 years, Redthroat 5 years 4 months, Speckled Warbler more than 10 years, Weebill 7 years 4 months, Brown Gerygone 9 years 11 months, Striated Thornbill 15 years 7 months, both Yellow and Inland Thornbills almost 12 years, and Yellow-rumped Thornbill 9 years 6 months. From field data, it is estimated that the Grey Gerygone has an average lifespan in excess of 5 years.

## Movements

Most of the Acanthizidae are resident, no member of the family making long-distance migrations, although some species undertake local wandering. Some of the Australian gerygones disperse northwards during the cooler winter months in the south. Such movements are known for the Western Gerygone in Western Australia and the White-throated Gerygone on the eastern seaboard. The situation is, however, complicated by the presence of resident populations, so that it can be difficult to distinguish visitors, which is one reason why the phenomenon remains poorly known. A number of other Australian species perform similar seasonal movements, monarch-flycatchers, fantails and petroicid robins, for example, moving to more favourable conditions farther north after breeding. Gerygones in New Guinea and the tropical islands of south-eastern Asia and the Pacific display no evidence of movements, a reflection of their stable tropical environments with plentiful food supplies.

During the severe El Niño drought of 1997, in Papua New Guinea, Brown-breasted Gerygones (*Gerygone ruficollis*) became very scarce or absent around Ambua, in the Southern Highlands province, suggesting the possibility of local movement, as numbers quickly built up again in the following years. In New Zealand, the Grey Gerygone shows some altitudinal migration during the autumn period on the east coast of the South Island, this being triggered by the first cold weather or severe frosts. This species has occurred as a vagrant farther south, in the Snares Islands, where a small influx took place in 1972.

The three species of mouse-warbler are resident and probably sedentary in their forest habitat in New Guinea, with no evidence of any movement reported. In eastern Australia, the Speckled Warbler likewise is largely resident and sedentary, but juveniles disperse locally before the start of winter, or in spring just prior to the next breeding season. Another species that is

primarily resident is the Weebill, which is widespread in Australia; it does, however, make some local movements and can turn up in unexpected sites, such as high up in the Great Dividing Range. Similarly, the three whitefaces are mainly resident, but the Southern Whiteface undertakes some local drought-related movements, at times shifting to wetter regions where it is not usually recorded, and the Banded Whiteface may display local nomadism in response to rainfall, moving to exploit optimal sites where some greenery and seeds exist.



In the wet tropical forests of north-east Australia, acanthizids encounter an additional threat to their breeding success, over and beyond running the double gauntlet of predators and parasitism that affects all family members: rain. A sodden nest means cold chicks, a state that usually leads to their demise. The **Fernwren** often counters this problem by placing its nest under an overhang on the bank of a creek or gully. This "roof" provides shelter from the elements. Following incubation by the female, the male reassumes his parental responsibilities, helping to feed the nestlings for the three weeks it takes them to fledge.

[*Oreoscopus gutturalis*, Paluma, Queensland, Australia.  
Photo: Clifford & Dawn Frith]

Ornithologists studying the **Buff-rumped Thornbill** have unearthed the most complex breeding system of any member of its genus. This species forages in clans of up to 20 birds, which split into groups of up to four individuals—usually one female and three males—for the breeding season. The quartet breed as a group, although only one male gets to mate with the female; the others help feed the incubating female and the nestlings. Groups gradually coalesce back into their clans, and all clan members feed the fledglings. At the end of the breeding season, young males remain within the clan territory but young females disperse outside it.

[*Acanthiza reguloides reguloides*, Canberra, Australia.  
Photo: Graeme Chapman]

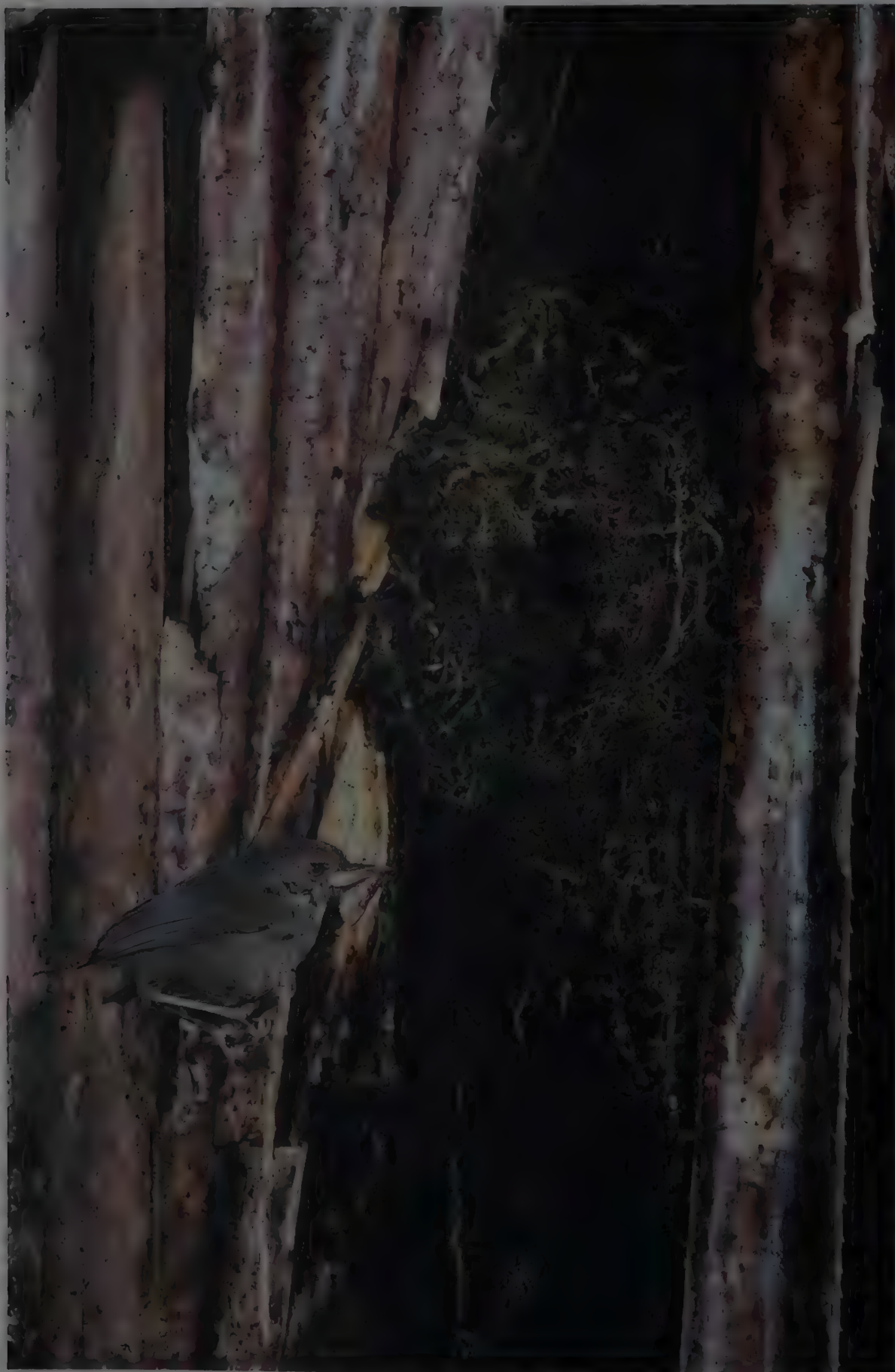


Much of what is known about the breeding biology of the **Large Scrubwren** is captured in this photograph. Indeed, the species is almost a metaphor for the difficulty of doing ornithological fieldwork in its New Guinea home. The Large Scrubwren is common over a wide area of this immense island, yet even this relative abundance has not prevented its nesting habits from remaining anything other than mysterious. The reason for such poor scientific understanding of this bird is its preference for rainforests in largely remote and inaccessible places. Even getting to such sites can be a logistical nightmare, so conducting the long-term fieldwork necessary for unraveling breeding biology is an understandable struggle. Nevertheless, intrepid researchers have recorded the Large Scrubwren breeding from April to December, which suggests that it breeds in both wet and dry seasons. Its nest is a bulky dome with a side entrance above the halfway point. It is constructed from dry leaves and rootlets, with a covering of coarse, moss-like liverwort and ferns. The lining comprises fibres and feathers. Two eggs are laid; these are whitish, washed purple-brown with scattered dark marks. Beyond these meagre data, nothing is known. In contrast to many acanthizids inhabiting less remote terrain, there is no information on incubation, nestling period, role of the sexes, or post-fledging care.

[*Sericornis nouhuysi*  
*stresemanni*,  
 Tari Gap,  
 Papua New Guinea.  
 Photo: Clifford &  
 Dawn Frith]







The *Crateroscelis* mouse-warblers of New Guinea belie their comparative abundance and wide distribution when it comes to the more secretive parts of their life, notably breeding. The nesting biology of this trio is exceptionally poorly known, largely due to the difficulty of the terrain. For the best-known species, the Bicoloured Mouse-warbler (*C. nigrorufa*), researchers have only ever found two nests. For the **Mountain Mouse-warbler**, the picture is even less clear. In common with those of its congeners, its nest resembles those of the scrubwrens (*Sericornis*) in that it is dome-shaped with a side entrance. The nest is constructed from rootlets, ferns and moss, the last of these often thought to be a contribution to waterproofing in the wet rainforest environment. The nest is lined with feathers to improve insulation for the eggs. The surprisingly varied nest locations include the fork of a small tree, under tree roots, under a small cliff and in a landslip. Breeding seasonality is hard to conjecture from the available data of nestlings being seen in December and a fledgling in August. Beyond these snippets of information, nothing is known about the Mountain Mouse-warbler's breeding biology.

[*Crateroscelis robusta*  
*sanfordi*,  
Tari Gap,  
Papua New Guinea.  
Photo: Clifford &  
Dawn Frith]

This adult **Southern Whiteface**—perhaps part of the breeding pair, perhaps one of the pair's helpers—is most likely returning to a nest to feed nestlings. Normally, barring parasitism, for example by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*), or predation, the Southern Whiteface nest contains three or four chicks, which may take over 19 days to fledge. The nest location of this species, like that of its congeners, is otherwise unusual in the family, often being placed in a natural or artificial cavity or even hidden within the stick nest of a raptor such as the Wedge-tailed Eagle (*Aquila audax*) or Whistling Kite (*Haliastur sphenurus*).

[*Aphelocephala leucopsis* leucopsis, Stawell, Victoria, Australia. Photo: Hans & Judy Beste/Lochman Transparencies]



The scrubwrens are almost entirely sedentary, both in Australia and in New Guinea, although the White-browed Scrubwren may make some altitudinal shifts during the winter months in south-east Australia, with some local wandering recorded. Scrubwrens in Tasmania are resident, as also are the fieldwrens and heathwrens in the more arid zones of mainland Australia, with purely local vagrancy reported for the Striated Fieldwren near Sydney. The Redthroat is evidently resident in the semi-arid and arid zones, with no movements reported, while the Rockwarbler is similarly resident in New South Wales, although it may move away from some areas in very dry conditions. Rain-forest species, of course, live in a less drought-afflicted habitat, and movements of the Fernwren away from its specialized damp habitat are unknown. Although there may be some slight altitudinal dispersal by the Pilotbird, difficulties in locating this species when it is silent obscure its status, but it is likely to be largely sedentary.

All of the thornbill species are basically resident in Australia, but the general pattern for this genus is somewhat complex. Some species exhibit changes in abundance and occurrence that suggest some kind of local movements. These are as yet poorly known, and may be elucidated only by long-term ringing studies. The Brown Thornbill shows this pattern in Victoria, with altitudinal dispersal involved, as well as winter dispersal by immatures. Its sister-species, the Inland Thornbill, is largely resident over much of the range, but it is known to appear on the Swan River coastal plain, around Perth, with the onset of autumnal rains, and other local movements are reported in central Australia. The Tasmanian Thornbill exploits slightly different habitat niches seasonally, and in the winter months it may move into more open areas, away from the usual dense forest habitat, but the phenomenon is still poorly known. Outside the breeding season, in Victoria, the Chestnut-rumped Thornbill forms mobile flocks, and various local wanderings are reported; still little known, some of these are probably in response to drought, fires or wet periods. The Buff-rumped Thornbill likewise makes some local movements, perhaps exploiting local abundance of food in specific habitats. Yellow-rumped Thornbills exhibit a similar pattern, with seasonal occurrence mainly in autumn–winter at some southern sites, many of these visitors perhaps wanderers

from nearby populations on post-breeding dispersal. The same applies to the southern populations of the Yellow Thornbill in south-east Australia. Striated Thornbills are mainly resident, but they exhibit altitudinal movements away from the higher levels of the Snowy Mountains and the Brindabella Range, in south-east New South Wales. This species also makes some local movements, probably again representing post-breeding dispersal.

### Relationship with Man

Acanthizids are typified by their small size, their dull plumages in most cases, and the fact that many live in forest habitats. Their interactions with humans are, therefore, limited.

Birds in New Guinea are frequently regarded as a source of scarce protein, and they are the targets for village boys with catapults, keen to practise their aim and perhaps acquire an opportunistic mouthful of food. One valuable repository of fast-disappearing tribal lore is to be found in *Birds of my Kalam Country*, by I. S. Majnep and R. Bulmer, which contains a reference to gerygones. In east-central New Guinea, the Kalam people of the upper Kaironk Valley, in the Schrader Range, know the difference between the Brown-breasted Gerygone and the Mountain Gerygone (*Gerygone cinerea*), the former being the species that moves around in the gardens among the casuarinas and the latter having a different call and living in the beech forest. One call of these species resembles the twitter of swiftlets (*Apodidae*), and there is a story about this in which the birds insult each other. The gerygone sings “dede-cy-o dede-cy-o, laplap ceg-o, laplap ceg-o”, reflecting the repetitive quality of the song and translatable as “keep your food hidden (in the rocks where the swiftlets nest), keep it hidden, your skin is big, your skin is big (but the body beneath is very small)”. The swiftlet replies “wog gy manban, waty gy manban, tap sy ok nep nban”, which means “you don’t make gardens, you don’t make fences, you just steal food and eat it”. The gerygone calls back “sy wey wey, sy wey wey”, meaning “secretly you eat it, secretly you eat, eat”, and this has been its local name ever since.

When the Kalam people hear the gerygone call “dede cy-o, laplap ceg-o, sy-wey-wey”, the last part gives the local name of





The three chicks in this White-browed Scrubwren nest are competing for their next meal. Incubated exclusively and brooded primarily by their mother, the nestlings are fed by both parents and any helpers assisting the breeding pair. Competition for food is essential, for only the well-fed nestling can survive to fledge; indeed, in the White-browed Scrubwren, only a third of hatchlings survive to leave the nest. For those that do so, the following week is critical, as almost a third of fledglings succumb then. Of those that make it through this period, almost all will live to independence.

[*Sericornis frontalis tweedi*, Glastonbury, near Gympie, SE Queensland, Australia. Photo: Cyril Webster]

*siweywey* and is a sign of fine weather. There is an interesting parallel here with the Grey Gerygone in New Zealand, where the Maori name for the species is *Riroriro*. The spring song of this gerygone was formerly a harbinger of the spring crop-planting for some Maori tribes. There is also a Maori saying relating to laziness, which translates as "Where were you at the crying of the *riroriro*?", a further reference to the spring song of this species.

Unlike most western ornithologists at the moment, the Kalam know the nesting habits of the two montane gerygones. They describe a domed nest in the casuarinas, bound with cobwebs and lined with soft seed fluff and tree-fern, and various feathers. They also recognize the Green-backed Gerygone, their name for this acanthizid meaning "haunts the oak foliage", which is where it is often found, shivering or quivering a lot as it moves.

Hunters in Australia used to call the Striated Fieldwren the "stink-bird", because it supposedly gave off a strong scent, which would distract their dogs when they were out hunting for quail (*Coturnix*). J. Gould reported a similar trait for the Rufous Fieldwren, the species emitting "so very powerful an odour that my dog frequently pointed at it from a very considerable distance". Curiously, in more recent times this strong scent has gone unmentioned.

Some areas in Australia have picnic sites or trails where both White-browed and Yellow-throated Scrubwrens have become tame and confiding. Foraging around tables and often at very close range, they give much pleasure to human visitors. The very localized Rockwarbler is known to do the same at a few sites near Sydney.

Certain members of the family are well known for the habit of nesting at times in close proximity to humans, the White-browed Scrubwren quite frequently using flower pots or sites on verandahs. The use of man-made objects is well documented, with nests often built inside cans or tins, but some less familiar items utilized for nesting by Chestnut-rumped Thornbills include old sacks and even an old pair of trousers. This species has been recorded also as nesting in the eye socket of a horse's skull, and the Southern Whiteface has been found nesting in a bullock skull, excellent examples of the opportunism of acanthizids. Indeed, the Southern Whiteface is a great opportunist, other odd nest-sites used by it including fence posts, gate posts and other man-made structures, the spout of a pump, the inside of an old pair of

boots, a coat pocket hung on a verandah, and a soup tin atop the wire netting of a chicken yard.

Birding tourism is a growing phenomenon within Australia, New Guinea and the Pacific islands, a few species acting as flagship birds for some conservation programmes. While none of the acanthizids has a very high profile in this context, restricted-range endemic species are always a draw and in high demand among keen birdwatchers. Examples from this family include the Atherton Scrubwren, the Fernwren and the Mountain Thornbill on the Atherton Tablelands, three regional Australian endemics guaranteed to feature on a birding itinerary in Queensland. Similarly, species of arid and semi-arid country, or "Outback" species, are always in high demand, with the Redthroat and both fieldwrens and heathwrens quite highly prized and sometimes not easy to see. The Pilotbird and the Rockwarbler form a highly sought-after pair near Sydney, and are the subject of many trips to local national parks. The twelve Tasmanian endemics are an important focus for birdwatching trips to that beautiful island, and include among them the Tasmanian Thornbill, the Tasmanian Scrubwren and the sometimes elusive Scrubtit.

During the famous and successful last-ditch efforts to save the Endangered Black Robin (*Petroica traversi*) of the Chatham Islands, east of New Zealand, one member of the family Acanthizidae figured importantly. The Chatham Gerygone, itself a very local restricted-range species, was used as a host for the Black Robin during the initial stages of that recovery programme, as it is very tolerant of nest disturbance and makes a good surrogate host. This gerygone should probably be regarded as Vulnerable on account of its restricted range and an apparent decline in part of this (see Status and Conservation).

### Status and Conservation

The acanthizids have so far not fared too badly, with just one species extinct since 1680 and two judged to be globally threatened. Many members of the family are quite widespread, but there is no room for complacency as some species have very restricted ranges on small tropical islands, which can be subject to immense changes over short periods of time. Looking at the longer time scale, too, the vast changes being wrought upon habi-



For the **Tasmanian Scrubwren**, managing the breeding process as far as eggs hatching is a major achievement. The pair will have had to build a nest that can withstand the elements and remain sufficiently concealed so as to avoid the attentions of predators and parasitic cuckoos. The 17-day incubation is also fraught with risks: too long off the nest and the eggs perish. Having managed so well up until hatching, it would make no sense if the adult scrubwrens let the nestlings' excreta reveal their location to predators, so a key task for adults is to remove the conspicuous white faecal sacs swiftly, disposing of them far from the nest.

[*Sericornis humilis humilis*,  
St Helens, Tasmania,  
Australia.  
Photo: Graeme Chapman]



This **Grey Gerygone** has placed its pendulous, pear-shaped nest in an exotic pine (*Pinus*) tree. The incumbent female is presumably either incubating her three or four pale, brown-spotted eggs, or brooding her nestlings. Incubation lasts a shade under three weeks. The chicks have a voracious appetite, so the female's responsibilities are not limited to keeping them warm: she must also join the male in catching insects and spiders and then feeding them to their growing offspring. The pair's parental responsibilities continue for several weeks once the chicks have fledged.

[*Gerygone igata*,  
Katikati, New Zealand.  
Photo: Brian Chudleigh]

tats throughout the globe will have far-reaching and usually unpredictable results. When one flies over the eastern and southern seaboard of relatively lightly populated Australia, it is sobering to see just how much habitat has been destroyed or irrevocably modified, so much so that it is a wonder, given the sheer scale of the changes, that so many species still remain in moderate numbers. Progressive loss of trees and woodland remnants, including roadside reserves, shelter-belts, coppices and remnant trees in paddocks, leads to a diminution in diversity for all species, not just birds. Invasive alien plant species modify habitats to unknown effect, and often take over huge areas. Many Pacific Ocean islands, for example, have suffered disastrous habitat loss from all-smothering vines, which preclude the regrowth of native plants and can alter habitat composition unfavourably for native birds.

Australia faces similar problems on a local scale, with lantana, blackberry, mimosa (*Mimosa*), bitou bush (*Chrysanthemoides monilifera*) and many other invasives having taken over large areas or drastically modified native habitats. In places, the composition and distribution of native grasses have been radically altered, with numerous invasives over extensive areas, and consequent adverse effects on the numbers of native estrildid finches and potentially other indigenous species, such as thornbills or whitefaces.

Habitat fragmentation also results in greater predation from both native and alien species. Opportunist predators such as currawongs, butcherbirds and kookaburras may have big impacts on local bird populations. The introduction of a serious nest predator, the Laughing Kookaburra, into Western Australia in 1897 and Tasmania in 1906 was very regrettable; this species is undoubtedly having an adverse, if largely unquantified, effect on local native birds. Foxes and feral cats also have huge impacts and reduce nesting success. In Western Australia, introduced Common Starlings (*Sturnus vulgaris*) have for many years been shot on sight, in an effort to keep a potential agricultural pest, as well as a competitor for hole-nesting species, out of the state.

Hitherto, only one member of the family Acanthizidae is known to have become extinct. The Lord Howe Gerygone was once a common resident in the native forest and second growth of Lord Howe Island, in the Tasman Sea 570 km east of Sydney, and in 1928, when the last confirmed sighting was made, the species was still described as common. By 1936, however, it was

gone from the island, probably extirpated by black rats (*Rattus rattus*), which came ashore from the stranding of the SS *Makambo* in 1918 and subsequently wreaked havoc upon a whole suite of endemic island taxa. It has been mooted that, in addition, some sort of disease might be implicated, but this would seem something of a coincidence. Even so, a congener survives on Norfolk Island, north-east of Lord Howe, and that island, too, harbours black rats. A proposal has been made that the Norfolk Gerygone (*Gerygone modesta*) be introduced on Lord Howe as an ecologi-







For all acanthizids for which data are available, parental responsibilities do not cease once their offspring have fledged. The female **Fairy Gerygone** (above) is putting intensive feeding effort into its recently fledged chick. As is often the case with the poorly known acanthizids of New Guinea's remote forests, there is no information on the duration of the Fairy Gerygone's incubation, nestling period or parental care following fledging. The adult **Yellow Thornbill** (below) has not been as fortunate as the Fairy Gerygone. The youngster it is feeding so intently is clearly not its own offspring. Instead, this thornbill has been duped into incubating and raising a **Shining Bronze-cuckoo** (*Chrysococcyx lucidus*), following brood-parasitism by a female of that species. At one Australian study site, over a quarter of Yellow Thornbill nests were parasitized by this cuckoo. If this were not bad enough, the fledgling cuckoo in the photograph is clearly well developed, and is exploiting its host's generosity to the full. In feeding the cuckoo fledgling so diligently and for so long, this adult Yellow Thornbill is reducing its chances of rearing a second brood that, with luck, might carry its own genes rather than those of another species.



[Above: *Gerygone palpebrosa personata*, Iron Range, N Queensland, Australia. Photo: Clifford & Dawn Frith.

Below: *Acanthiza nana modesta*, Ocean Grove, Victoria, Australia. Photo: Peter Fuller]

The Acanthizidae have not done too badly when it comes to species survival. Granted, one species has gone extinct, but only two extant taxa are globally threatened. As befits a family with several insular species, however, some acanthizids are classified as restricted-range species. One such is the **Atherton Scrubwren**, whose distribution is a twist on actual "insular" populations in that it occurs only on disjunct mountain tops in north-east Australia. The westward expansion of rainforest in the region means that its available habitat, unlike many species, is actually increasing. As such, although uncommon, this scrubwren's future is probably secure.

[*Sericornis keri*,  
Atherton Tableland,  
N Queensland, Australia.  
Photo: Clifford &  
Dawn Frith]



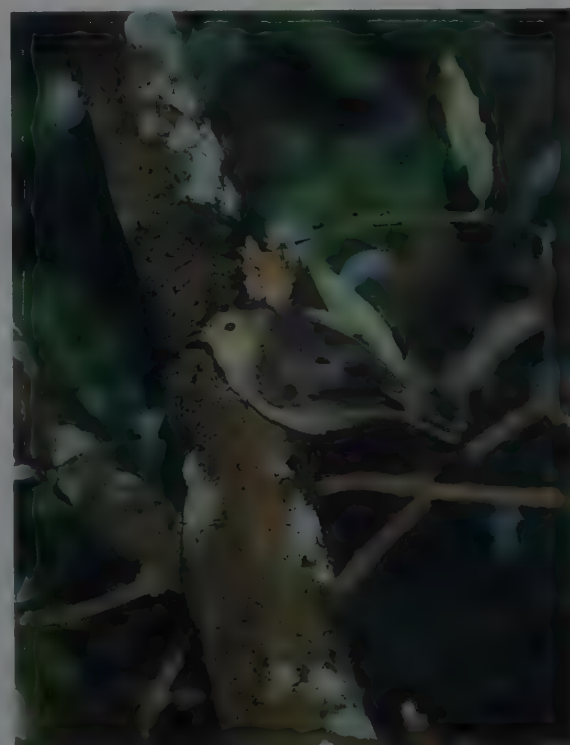
cal equivalent and as a back-up population for a restricted-range species. As a point of interest, both the Lord Howe and the Norfolk Gerygones are sometimes treated as subspecies of the Grey Gerygone of New Zealand, but the three appear to be distinct in plumage and probably song.

The Norfolk Gerygone is currently listed as Vulnerable. It is confined to one small island which, as well as having black rats, has suffered substantial habitat modification. It is still widespread on the island, where it is found in remnant areas of native tree or shrub vegetation, such as rainforest, thickets and gardens. The species is thought to number approximately 3000 individuals, although its visibility may lead to its abundance being overestimated. Norfolk Island National Park encompasses the main surviving stands of native forest on the island. Although the Norfolk Gerygone appears not to be at any immediate risk, and although its population is probably stable at present, the species nevertheless remains susceptible to catastrophic events, both natural and anthropogenic.

The other globally threatened member of the family is likewise an island form. This is the poorly known Biak Gerygone, restricted to the fairly small and much-modified island of that name, and its twin, Supiori, in Geelvink Bay, in New Guinea. Until very recently it appeared on the Endangered list, but it has recently been removed on purely taxonomic grounds, in that BirdLife International no longer recognize it as a valid species. Whether it is treated as a species (as here), or a race, there is no doubt that its future looks bleak, on the basis of its very small range, which is thought to be declining as the habitat becomes increasingly fragmented through logging and clearance for agriculture. The gerygone's total population is considered to be certainly fewer than 3000 individuals. Much of the forest on Biak has already been destroyed or damaged, and the remainder is under severe pressure; Supiori consists mostly of virtually impenetrable forested limestone mountains, which are presumably safe from alteration. There are extremely few recent observations of this taxon, all in lowland forest and scrubby vegetation. It was recorded in the Biak-Utara Reserve in 1997, and one or two sightings per day were made in June and July 2006. Some suitable habitat survives on Supiori, where the gerygone has been observed near the village of Surendeweri and also in a patch of forest near Wari village. If this bird is a lowland-forest specialist, however, much of the forest on Supiori may be too high up to be

suitable for it. Surveys are urgently required, on both Biak and Supiori, in order to determine the present distribution and population level of the Biak Gerygone and its precise habitat requirements. In addition, there is a need for the field identification and taxonomy of gerygones on the islands to be investigated thoroughly, as it is even possible that more than one species may be involved.

A further two members of the family are categorized as Near-threatened. These are the Speckled Warbler and the Chestnut-breasted Whiteface. The former has undergone, and continues to suffer from, habitat destruction and modification, coupled with



Few acanthizids make as far south as New Zealand, but the **Chatham Gerygone** is one that does. Confined to forested parts of southern Chatham Island and five smaller offshore islands nearby, this is a restricted-range species. Rats, feral cats and habitat reduction have caused a decline, but this gerygone remains locally common and there is recent evidence of a welcome population increase as a subsidiary benefit of predator-control programmes implemented to assist the conservation of birds such as the **Magenta Petrel** (*Pterodroma magentae*).

[*Gerygone albofrontata*,  
Chatham Island,  
E of New Zealand.  
Photo: Peter Reese/  
Nature Picture Library]





The **Dusky Gerygone** is a restricted-range species and is the only bird endemic to the West Australian Mangroves Secondary Area. Occurring only in mangrove woodlands and coastal thickets, it is generally poorly known, but appears frequent or fairly common in at least parts of its range. The Dusky Gerygone's preferred habitat is fairly remote, and this may have helped it escape destruction or alteration. For the time being, there is no specific threat to the future of this distinctively pale-eyed gerygone.

[*Gerygone tenebrosa tenebrosa*, Crabe Creek, Roebuck Bay, near Broome, NW Western Australia, Australia. Photo: Ian Montgomery]

predation, along the eastern seaboard of Australia. Despite this, however, it is still widespread and in some areas not uncommon, with a total population estimated at no more than 400,000 individuals. In contrast, the Chestnut-breasted Whiteface has a very restricted range, being confined to desert and semi-desert inland areas of South Australia, and is rather rare. It is adversely affected by severe drought, overgrazing by stock and some local habitat loss to mining activities.

Adopting a more regional scale, Australia has several taxa of conservation concern. The recently described Scrubtit subspecies *greeniana*, on King Island, in Bass Strait, is "Critically Endangered", with loss of habitat the major factor; the population has been reduced to fewer than 200 individuals in remnant vegetation, and the taxon is now absent from the single largest suit-

able block remaining. The Brown Thornbill race *archibaldi*, also of King Island, similarly has a "Critically Endangered" regional classification, and may already have succumbed, as the last records appear to be from 1968 and 1971; habitat loss was again the major culprit. Known as the "Samphire Thornbill", the subspecies *rosinae* of the Slender-billed Thornbill is classed as "Vulnerable" owing to loss of its restricted saltmarsh habitat to land development around St Vincent's Gulf, in the Adelaide region. Its estimated population is below 10,000 individuals. The eastern race of the Slender-billed Thornbill, *hedleyi*, is classified as "Near-threatened", having a population of about 12,000 birds, mostly in Victoria, while the nominate race of central Australia is "of Least Concern", so that the species as a whole is not considered globally threatened. On the Torres Strait islands of Boigu



The **Tasmanian Thornbill** is one of two restricted-range acanthizids—the other being the Scrubtit (*Acanthornis magnus*)—that occur only in the Tasmania Endemic Bird Area, comprising Tasmania and its satellites. The thornbill is quite common, and one race is even increasing in numbers. It is, however, dependent on habitats with a dense shrub layer, and thus is absent or rare in heavily cleared agricultural areas. Fortunately, much suitable habitat occurs in protected areas, and the species' future seems secure.

[*Acanthiza ewingii ewingii*, Mt Field, Tasmania, Australia. Photo: Peter Fuller]

The **Speckled Warbler** of south-east Australia remains too abundant to be classified as globally threatened, with a population of some 400,000 birds. However, the population density of this acanthizid has declined in tandem with destruction of its preferred habitat of dry sclerophyll eucalypt (Eucalyptus) forest. Although it is more resilient to habitat loss than previously thought, remaining woodland fragments are gradually becoming unsuitable as a result of competition with invasive species and changes to the vegetation structure. Therefore, the Speckled Warbler is considered *Near-threatened*.

[*Chthonicola sagittatus*, near Brisbane, SE Queensland, Australia. Photo: Brian J. Coates]

and Saibai, close to and zoogeographically part of New Guinea but politically part of Australia, the Large-billed Gerygone taxon, presumably *brunneipictus*, has undergone some habitat loss. Because of this, and its restricted Australian range, it is classified as "Near-threatened" in Australia, even though it remains common nearby in New Guinea.

Three fieldwren taxa are of regional concern. The subspecies *dorrie* and *hartogi* of the Rufous Fieldwren are currently listed as "Vulnerable", each restricted to a single very small island and constantly at risk of habitat change, catastrophic events such as cyclones, or the accidental introduction of predators. The third taxon of concern is the monotypic Western Fieldwren, considered "Near-threatened" in the much-modified wheatbelt of Western Australia.

Some other acanthizids, although not currently listed as being at risk, might merit listing as Vulnerable. Examples include the Western Thornbill and the Banded Whiteface, each of which has a quite extensive range but exists at fairly low density and, again, faces habitat modification and loss. Poorly known small-island endemics such as the Rufous-sided Gerygone and the Plain Gerygone are also potentially vulnerable, being subject to habitat loss and degradation with the burgeoning human population, and facing the ever-present possibility of such catastrophic events as cyclones.

The Chatham Gerygone should probably be regarded as Vulnerable on account of its restricted range, coupled with evident long-term population declines on the main island of the group, Chatham, where it is rare in the north, and its small numbers on Pitt Island. The species is common on tiny Mangere and South East Island, which are both strict nature reserves with controlled access, but it is vulnerable to any ecological changes there. Recent population increases have been noted in the southern part of the main Chatham Island, in areas where predator-control programmes have been implemented to assist the conservation of endangered taxa such as the Magenta Petrel (*Pterodroma magentae*) and the distinctive race, *chathamensis*, of the New Zealand Pigeon (*Hemiphaga novaeseelandiae*).

Birds Australia, BirdLife International's representative in that country, carries out a selective annual audit on the state of the nation's birds, focusing each time on particular groups, such as forest and woodland birds, in 2005, and invasive species, in 2006. The *New Atlas of Australian Birds* is a continuing project that will provide a valuable baseline for the assessment of future range and distributional data following the publication of the atlas itself, in 2003. Encouraging features are the rapid growth of envi-

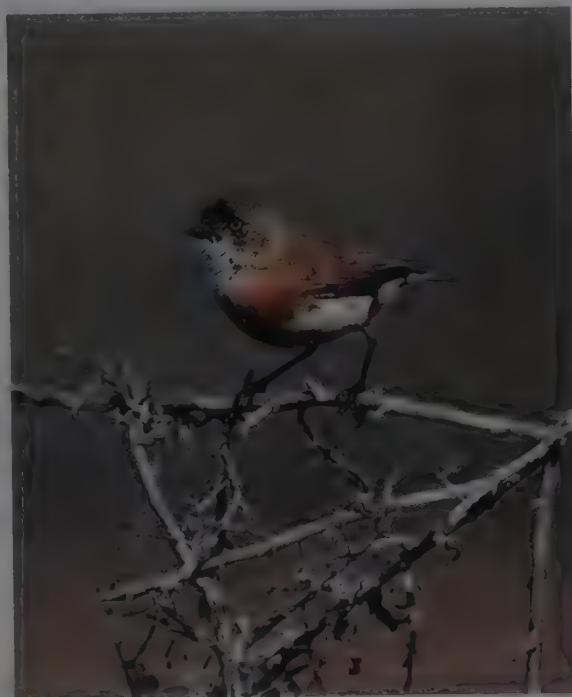


ronmental awareness and a recognition of the challenges and problems that lie ahead, these slowly feeding into the political process and helping to enable at least a start to be made towards a much more sustainable provision for the future. The Acanthizidae can only benefit from this.

The situation in New Guinea and the Pacific islands is much more uncertain, with politics and economics much less settled and governments much less accountable overall. Rapacious short-term attitudes towards the environment are, sadly, still quite common. Serious damage to forest habitats has occurred in recent times in the Solomon Islands and New Guinea, where a desperate need for cash incomes is driving unsustainable and harmful projects. Top-level political and military involvement makes it very difficult or even impossible to have acceptable environmental-impact assessments made before such projects are given the go-ahead. Here, all that conservationists can do is to attempt to bring political and perhaps economic pressure to bear, with initiatives such as buying only those hardwoods that are from certified and approved projects. Meanwhile, it is worth trying to monitor the state of the habitat and the status of species of conservation concern. A model of local-level conservation initiatives is the Crater Mountain Integrated Conservation and Development Area in the highlands of eastern New Guinea, which shows what can be achieved with proper support and a willing local community, at least in the short term. Local ecotourism initiatives, such as the Ekame Lodge, near Kiunga, in Western Province of Papua, and Keki Lodge, near Madang, in the foothills of the Adelbert Mountains, are also worthwhile and ethically sound.

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None of Australia's three species of whiteface (*Aphelocephala*) is particularly common, but the **Chestnut-breasted Whiteface** is the rarest of them. In 1990, the population of this restricted-range species was estimated to be just 6000, all in the South Australian Desert Secondary Area. This was thought to represent a decline which included a number of local extinctions. A repeat survey in 1999 revealed no further decrease, so the species' conservation status was downgraded from Vulnerable to Near-threatened, where it remains today.

[*Aphelocephala pectoralis*, Mt Lyndhurst, South Australia, Australia. Photo: Graeme Chapman]





## Subfamily SERICORNITHINAE

### Genus *PYCNOPTILUS* Gould, 1851

#### 1. Pilotbird

##### *Pycnoptilus floccosus*

**French:** Pycnoptile compagnon **German:** Leierschwanzlakai **Spanish:** Acantiza Piloto

**Taxonomy.** *Pycnoptilus floccosus*, Gould, 1851, Brindabella Ranges towards Murrumbidgee River, New South Wales, Australia. Taxonomic placement unresolved; some features suggest a link with bristlebirds (Dasyornithidae), perhaps a result of convergence, but others fit present family, of which currently treated as an aberrant member. Two subspecies recognized.

##### **Subspecies and Distribution.**

*P. f. floccosus* Gould, 1851 – Snowy Mts of New South Wales (from Brindabella Range S to Kosciuszko escarpment), in SE Australia.

*P. f. sandlandi* Mathews, 1912 – coastal New South Wales (S from Newcastle) and Victoria (E from Melbourne).



**Descriptive notes.** 17–19 cm; 27 g. Large, plump, big-headed, stout-billed ground-dwelling acanthizid with long and full rounded tail, rather bulbous-looking forehead and prominent eye; tail often held cocked and flicked up and down; when excited, fans tail and raises feathers of crown and nape. Nominant race has crown to nape dark brown, contrasting with dull buffy-rufous forehead, lores, eyering, ear-coverts, malar region, chin and throat, each feather edged dusky (giving scalloped effect); upperparts, including upperwing and tail, dark brown, with rufous wash on rump; underparts rufous-brown with brown feather centres and

edges (scalloped effect), belly white, sometimes with fine dusky scalloping, undertail-coverts dark olive-brown; iris dark red or crimson; bill greyish-black, grading to pale brown or dull pink on base of lower mandible, gape light grey or dull pink; legs dark grey to dark brown, soles paler pinkish-brown. Sexes similar. Juvenile is suffused greyish on chin and throat, lacks dark scalloping, being entirely uniform russet-brown, richer on flanks, vent and undertail-coverts, grey-black of bill merging to dull yellowish or flesh on lower mandible, gape pale yellow or whitish, iris grey-brown. Race *sandlandi* differs only slightly from nominate, has shorter wing, tail and bill, somewhat paler plumage. Voice. Loud, rich, ringing, piercingly sweet musical call of 3–5 syllables, upward-inflected, with quiet introductory squeaky notes and then loud “pee choo wee” or variants, differing regionally, often transliterated as “guinea-a-week”, and very strong for size of bird; very similar to that of Eastern Bristlebird (*Dasyornis brachypterus*). Female, too, may give these calls and make softer responses to them, often when foraging (when seems to use them for contact). Antiphonal singing noted, and territorial calls reportedly carry farther. When nesting, female may leave nest and call, male answering quickly and then appearing with food. Mimicry reported but not in full song, some calls similar to those of whipbird (*Psophodes*). Alarm a trisyllabic “wit-wit-wong” and disyllabic “wit-tui”, used when partners separated; if no response to this, song may be given; disyllabic “teewit” usually given by female in reply to male’s song. Single upward-inflected “see” when male offers food to female or when feeding young. Fledglings give soft wheezing call when following parents and give quiet songs after c. 2 months.

**Habitat.** Ground layer of temperate wet sclerophyll forests, occasionally in dry sclerophyll, and moist gulleys and dense undergrowth on ridges; occasionally in temperate rainforest. Sea-level to tree-line; nominate race at 800–1500 m in alpine regions, coastal *sandlandi* below 1000 m.

**Food and Feeding.** Insectivorous; occasionally eats seeds and fruit. Arthropods taken include beetles (Coleoptera), wasps (Hymenoptera), ants (Formicidae), Lepidoptera and phasmids (Phasmatodea); seeds include those of genera *Panicum*, *Geranium*, *Piptosporum*, *Rosa* and *Rubus*. Generally in pairs, or in family groups; maintains territory throughout year. Forages on ground below forest understorey, also on damp ground near streams. Uses feet to turn over debris, and tosses leaf litter with bill. Well-known but perhaps seldom seen association with Superb Lyrebird (*Menura novaehollandiae*); follows latter and takes advantage of prey disturbed by its scratching of the soil.

**Breeding.** Season Aug–Feb; double-brooded, maybe even triple-brooded. Apparently breeds as monogamous pair. Nest quite large, domed, with oval entrance at side near top, sometimes with platform or hood, made from bark, leaves, grass and rootlets, lined with feathers or fine grass and with inner layer of bark fibre or grass; placed on or close to ground, hidden among dense low vegetation such as ferns, grass tussocks, vines and fallen wood, often near creek or road cutting; probably site-faithful. Clutch 2 eggs, ground colour variable, from drab to smoky brown and dusky grey to rich dark purplish, often darker at large end, where a distinct band of spots or markings; incubation by female alone, period 20–22 days; nestling period 14–17 days; male often feeds female during nesting period, even calling her off nest and giving food; male looks after young when female incubating second or third clutch; family-members remain together for some time after young fledge. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*). Recorded longevity at least 11 years 11 months.

**Movements.** Resident; in territory throughout year. Some local winter wandering possible. Of 67 recoveries of 28 ringed individuals, all were within 10 km of ringing site.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Australia EBA. Fairly common within its relatively small range. Has suffered some contraction of range as a result of clearance and urban development, but much of its habitat is within national parks or reserves.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Christidis & Boles (1994), Emison *et al.* (1987), Frith (1969), Higgins & Peter (2002), Howe (1915), Keast *et al.* (1985), Love (1998), McCullough (1991), McGill (1970), Morecombe (2003), North (1904), Pizzey *et al.* (2005), Robinson (1975), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Smith (1984), Zwart (1973).

## Genus *ORIGMA* Gould, 1838

#### 2. Rockwarbler

##### *Origma solitaria*

**French:** Origma des rochers **German:** Steinhüscher **Spanish:** Acantiza Minero  
**Other common names:** Origma

**Taxonomy.** *Sylvia solitaria* Lewin, 1808, Parramatta, New South Wales, Australia.

**Monotypic.**

**Distribution.** Coastal SE New South Wales (R Hunter S to Bega), in SE Australia.



**Descriptive notes.** 12.5–15 cm; 14.5 g. A small, scrubwren-like, mainly terrestrial bird with longish square-ended tail. Plumage is dark brownish-grey above, with dark rufous wash on rump, distinctively contrasting blackish-brown tail; lores and ear-coverts warmer brown, narrow white eyering; chin and throat contrastingly whitish with dark grey mottling (tipped paler when fresh); underparts dark rufous-brown, undertail-coverts dark brown; iris dark brown or dark red-brown; bill blackish-brown to dark grey, pinkish-brown base of lower mandible; legs grey-black or dark blackish-brown. Differs from *Pycnoptilus floccosus*

in smaller size, slimmer and much smaller-headed appearance, longer and square-ended tail, white throat. Sexes similar. Juvenile is like a paler and duller adult, has greyer chin and throat washed rufous, contrasting less with head and underparts. Voice. Calls mainly during breeding season, a plaintive shrill, “chis-sick” given repetitively; also a scolding chatter like that of *Sericornis* but higher-pitched, and a rasping slightly liquid contact call: trisyllabic “tid e da” or “tid-ed-dee tid-ed-dee” also noted. Known to mimic *Pycnoptilus floccosus*, *Sericornis frontalis*, *Acanthiza reguloides*, White-eared Honeyeater (*Lichenostomus leucotis*), Eastern Spinebill (*Acanthorhynchus tenuirostris*), Rufous Whistler (*Pachycephala rufiventris*) and Grey Butcherbird (*Cracticus torquatus*). Rasping, slightly liquid note given as alarm.

**Habitat.** Strongly associated with exposed sandstone, limestone, granite and other rock formations, often near water. Inhabits gulleys, steep rocky hillsides, ravines, rocky outcrops and cliffs, sometimes adjacent car parks; recorded from sea cliffs and rocks. In these habitats associates with open eucalypt (*Eucalyptus*) woodland, heath and shrubland; avoids moist forest and woodland.

**Food and Feeding.** Insectivorous, but will take seeds. Food recorded includes beetles (Coleoptera), ants (Formicidae), wasps (Hymenoptera), lepidopteran larvae, also seeds of *Panicum* and *Triticum*, chenopods and *Eucalyptus melliodora*; bread crumbs and butter taken at picnic sites. Seen singly or in pairs, and in family groups up to five individuals, often confiding and bold; flicks tail laterally. Forages mainly on ground and rocks, but also low down in trees and shrubs, or on tree trunks. Probes into fissures; works ledges, overhangs, rock faces and boulders, also leaf litter, and seen to sally-hover for insects. Can move up vertical rock faces. Flight low and swift, usually for only short distance.

**Breeding.** Breeds Aug–Jan; sometimes double-brooded. Lives in pairs; probably monogamous. Nest usually built by both partners, ovate and tapered at both ends, with side entrance (sometimes hooded) at widest part, constructed from rootlets, moss, grass stalks and bark fibres, may be covered by spider egg sacs and bark fibre, inner layer less cohesive, of bark, leaves and grass, lined with feathers and plant down; suspended from surface, narrowly attached by spider web, wedged into place by bill and covered by secretion (likely saliva), in cave or other sheltered rocky site, or often artificial site (e.g. road culvert, shed, tunnel, mine shaft, building) used, and often in total or near-total darkness; nest sometimes reused, and nesting site may be utilized in successive years (five years documented). Clutch 3 eggs, sometimes 2, white (with apricot wash when fresh) with very faint sparse reddish-brown spotting; incubation period 21–27 days; nestling period 16–21 days; sometimes fearless around nest, will scold loudly and may approach intruder while holding wings outstretched and lowered. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*); suggestion that weight of young cuckoo sometimes causes nest to fall to ground. Nest contents preyed on by goannas (*Varanus*) and eastern water dragons (*Physignathus lesueurii*), also by currawongs (*Strepera*).

**Movements.** Resident; reported to move away in very dry conditions.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Eastern Australia EBA. Fairly common but at rather low density; lives in pairs in large exclusive home ranges, which can be up to 2 km<sup>2</sup> in extent. Recorded from coast inland to tablelands of Great Divide within 240-km radius of Sydney. Vulnerable to local habitat loss owing to urban development and land clearance. Much of the species’ habitat, however, is secure within national parks and reserves.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Christidis & Boles (1994), Higgins & Peter (2002), Hindwood (1926), Hoskin (1991), Keast *et al.* (1985), McGill (1970), Morcombe (2003), North (1904), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Sontter (1985).

## Genus *OREOSCOPUS* North, 1905

#### 3. Fernwren

##### *Oreoscopus gutturalis*

**French:** Sériorne des fougères **German:** Farnhüscher **Spanish:** Acantiza de Helechal  
**Other common names:** Australian Fernwren, Collared Scrubwren

On following pages: 4. Rusty Mouse-warbler (*Crateroscelis murina*); 5. Bicoloured Mouse-warbler (*Crateroscelis nigrorufa*); 6. Mountain Mouse-warbler (*Crateroscelis rubrista*); 7. Yellow-throated Scrubwren (*Sericornis citreogularis*); 8. White-browed Scrubwren (*Sericornis frontalis*); 9. Tasmanian Scrubwren (*Sericornis humilis*); 10. Atherton Scrubwren (*Sericornis kerni*); 11. Large Scrubwren (*Sericornis nouhuysii*); 12. Perplexing Scrubwren (*Sericornis virgatus*); 13. Tropical Scrubwren (*Sericornis beccarii*); 14. Large-billed Scrubwren (*Sericornis magnirostra*).



**Taxonomy.** *Sericornis gutturalis* De Vis, 1889, Herberton, northern Queensland, Australia.

**Distribution.** NE Australia: NE Queensland, from near Cooktown S to Mt Spec (in Paluma Range, near Townsville), extending inland to Herberton Range and Cardwell Range.



**Descriptive notes.** 12–14 cm; c. 20 g. A long-billed, short-tailed terrestrial, scrubwren-like species. Plumage is dark brown above, with narrow white supercilium, broad blackish-brown eyestripe; chin and throat white, underparts warm olive-brown, black crescent on upper breast; iris dark brown; bill black; legs greyish-pink or light brown. Sexes reported as being alike in plumage in museum specimens; field observations suggest otherwise, presumed female being duller than male, with smaller breast-crescent and less distinct supercilium (frequent sightings of two closely associating individuals with these differing plumages).

Juvenile lacks breast-crescent, has throat mottled, underparts light brown. Voice. Song, often from fallen branches or saplings within 1 m of forest floor, mainly in breeding season, a distinctive series of repeated ringing, drawn-out, high-pitched whistles, "two-two-two-two-two", rising to climax. Contact call a soft piping "chip, chirr-ip"; alarm a distinctive rasping, rising "shweeee", also harsh churs, and a scolding staccato 5-note descending series, followed by 3 prolonged and higher "chip" notes. Said to be an accomplished mimic, but confirmation required.

**Habitat.** Wet tropical forest and old regrowth, particularly in damp shady gulleys, tablelands and gorges with ferns, rattans (Calameae), vines and thickets. From 300 m (Kuranda) to 1500 m; seldom below 900 m in drier parts of range.

**Food and Feeding.** Arthropods, also small skinks (Scincidae). Forages usually singly or in pairs. Quiet and unobtrusive in dense shady habitat, but not particularly shy; forages among damp leaf litter or on fallen or lower branches, sometimes burying itself beneath leaves or throwing them into the air. Techniques include gleaning, scratching and probing. Sometimes associates with Orange-footed Scrubfowl (*Megapodius reinwardi*) and Chowchilla (*Orthonyx spaldingii*), following in close proximity and catching prey disturbed by their feeding actions.

**Breeding.** Season Jul–Feb, mainly Oct–Nov. Probably maintains territory all year, but most vocal when breeding. Nest built by both sexes, domed, with oval side entrance, made from moss, roots and rootlets, sticks, leaves and lichen (nest often black-looking and well camouflaged); placed close to ground and hidden in hole, crevice or fern clump, often where tree roots have rotted away, often in creek bank or gully bank, with liking for overhang (to which nest may be attached). Clutch 2 eggs, white with a few faint reddish-brown spots; incubation possibly by female alone, period poorly known, 29 days recorded; chicks fed by both sexes, nestling period 21–23 days.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Queensland Wet Tropics EBA. Uncommon and secretive species inhabiting damp dark areas; often difficult to locate, but distinctive rasping alarm call a good indicator of its presence. Confined to high-altitude rainforests of far N Queensland, many of which lie within protected areas. Nests sometimes used by other species, e.g. two species of vespertilionid bat recorded as roosting in nests of this acanthizid.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Christidis & Boles (1994), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Joseph & Moritz (1994), McGill (1970), Morcombe (2003), Nielsen (1996), Pizzey *et al.* (2005), Pockley (1954), Schodde & Mason (1999), Schulz (1998), Serventy *et al.* (1982), Slater *et al.* (2003), Wieneke (1992a).

## Genus *CRATEROSCELIS* Sharpe, 1883

### 4. Rusty Mouse-warbler

#### *Crateroscelis murina*

**French:** Séricorne fauve **German:** Brauntücken-Waldhüscher **Spanish:** Acantiza Ratona  
**Other common names:** Chanting/Lowland/Rusty Mouse-warbler, Lowland/Rusty Mouse-babbler

**Taxonomy.** *Brachypteryx murinus* P. L. Slater, 1858, Lobo, Triton Bay, south-western New Guinea.

**Subspecies and Distribution.**

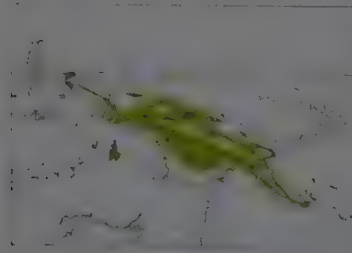
*C. m. capitalis* Stresemann & Paludan, 1932 – West Papuan Is (Waigeo, Batanta).

*C. m. fumosa* Ripley, 1957 – Misool (S West Papuan Is).

*C. m. murina* (P. L. Slater, 1858) – Salawati (West Papuan Is) and Yapen I (in Geelvink Bay), and most of mainland New Guinea.

*C. m. monacha* (G. R. Gray, 1858) – Aru Is.

*C. m. pallida* Rand, 1938 – Trans-Fly lowlands of S New Guinea.



**Descriptive notes.** 12 cm. A small, dull long-legged acanthizid; skulks on forest floor. Male nominate race has top of head black, upperparts, including upperwing and tail, dark olive-brown or rufous-brown, slightly more rufous on uppertail-coverts; throat white, underparts dull rufous brown; iris scarlet or red; bill black, pinkish lower mandible; legs pale pinkish, or with grey feet. Female is similar to male but duller, with crown and lores brownish (not black). Juvenile has brown iris and dark brown bill. Races differ in biometrics (nominate quite large, wing 61 mm) and some plumage features: *monacha* is similar to

nominate, but white below except for tawny on lower throat and brownish breast side and flanks. *pallida* has crown olive-brown, much white on underparts; *capitalis* has brown crown and ochraceous underparts, small size (wing 57 mm); *fumosa* has blackish-brown crown and ochraceous underparts, smallest race (wing 54 mm). Voice. Vocal virtually throughout year, mostly in early morning and late afternoon (but can be heard at any time of day). Usual call a variation on a

musical mournful whistle of 3 or 4 notes, "too tee tee", "tee too tee", "too tee too" and similar, can be repeated with small variations for minutes on end, each phrase locking into repeated pattern for several minutes and then changing to next one; phrase can sound like the initial notes of tunes "Three Blind Mice", "Happy Birthday" or even "God Save the Queen". A skilled mimic, though mimicry not commonly heard; imitates members of mixed-species flocks, e.g. Filled Monarch (*Arses telescopthalmus*), also non-passerines, e.g. copies the screeches of Rainbow Lorikeet (*Trichoglossus haematodus*). Harsh, scolding, dry, rather *Sericornis*-like "tr tr tr" alarm given when anxious.

**Habitat.** Primarily hill forest, from 460 m, occurring in lower mountains to c. 1700 m. Occupies a terrestrial and low-level niche, haunting understorey and shrubs, sometimes in dense areas but also in fairly open places. Replaced at higher altitude by *C. robusta*. At Efogi, in Central Province, three species of mouse-warbler overlap within narrow altitudinal band, present species up to 1280 m and common below 1250 m, *C. robusta* as low as 1250 m but common from 1280 m upwards, and very local *C. nigrorufa* at c. 1250 m (where it seems, paradoxically, the commonest of the three); ecological separation presumed achieved through niche selection, perhaps present species foraging in lowest understorey levels and *C. nigrorufa* in highest.

**Food and Feeding.** Diet poorly known; arthropods eaten. Usually seen singly or in pairs; sometimes in parties of three or four individuals, probably family groups. Forages low in understorey, seldom above c. 1.5 m, and spends a lot of time on ground, hopping on fallen trunks and sometimes on sides of trees. Jumps up to glean morsels from undersides of leaves (long legs perhaps an advantage); not seen to sally for prey. Bounds along rapidly; hops rapidly from perch to perch when alarmed, flying fast to other perches usually not far away.

**Breeding.** Poorly known. Eggs found in Sept and young in Jul. Nest domed, with side entrance, lined with vegetable fibres, one was in small hollow under a clump of ferns. Clutch 2 eggs, mainly uniform buff-brown, reddish-grey or darker brownish, sometimes with shadowy darker zone of smudged spots around larger end; no information on incubation and nestling periods.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Common and widespread in New Guinea, where its voice is one of the characteristic sounds of hill forest. Heard far more often than it is seen. Despite the fact that this is a common species, its ecology and breeding biology are still poorly known.

**Bibliography.** Beecher *et al.* (1986), Coates (1990), Coates & Peckover (2001), Gilliard & LeCroy (1961a), Greenway (1966), Gregory (1995a, 1995b, 2004), Gyldenstolpe (1955b), Mayr & Rand (1937), Peckover & Filewood (1976), Rand & Gilliard (1967), Stresemann & Paludan (1932a, 1932b).

### 5. Bicoloured Mouse-warbler

#### *Crateroscelis nigrorufa*

**French:** Séricorne noir et roux

**Spanish:** Acantiza Bicolor

**German:** Schwarztücken-Waldhüscher

**Other common names:** Black-backed/Black-headed/Mid-mountain Mouse-warbler, Mid-mountain Mouse-babbler

**Taxonomy.** *Sericornis nigro-rufa* Salvadori, 1894, Moroka, New Guinea.

Two subspecies recognized.

**Subspecies and Distribution.**

*C. n. blissi* Stresemann & Paludan, 1934 – W New Guinea (Weyland Mts and N slope of Snow Mts).

*C. n. nigrorufa* (Salvadori, 1894) – E & SE New Guinea discontinuously from upper R Sepik (Thurnwald Range), Mt Giluwe, Tari Gap and Wahgi area E to Huon Peninsula (Sarawung Mts), Wharton Range and Owen Stanley Mts.



**Descriptive notes.** 12–13 cm. A small, dark, long-legged terrestrial acanthizid. Nominate race is blackish-brown or black above, including upperwing and tail; chin, throat and underparts quite bright rufous to reddish-chestnut, becoming duller on lower abdomen; iris red-brown; bill brownish-grey; legs brownish-black. Differs from rather similar *C. murina* in being much darker above, uniformly rufous below. Sexes alike. Juvenile undescribed; suspected juvenile at Myola (Owen Stanley Range) was duller brown above, with bright reddish-chestnut throat, dull brownish underparts. Race *blissi* differs from nominate in having

abdomen black with olive wash. Voice. Poorly known. Contact call reported as 2 short whistles followed by slightly upslurred third; responds to imitations of call.

**Habitat.** Mountain forest at 1220 m–2500 m, in variable narrow altitudinal band (c. 50–370 m wide) between *C. murina* of lower levels and *C. robusta*. Narrow zone of overlap with both congeners in a few areas (as at 1250 m at Efogi, in Central Province), ecological-separation mechanism unknown, presumably achieved through niche selection. Specimens from Herzog Mts taken at 1370–1490 m, with *C. murina* up to 1370 m and *C. robusta* down to 1520 m; in Aseki area (Morobe Province) specimens from range 1520–1580 m, with *C. robusta* down to 1520 m; at Mindik (Huon Peninsula) specimens from range 1490–1860 m, with *C. murina* up to 1580 m and *C. robusta* down to 1770 m.

**Food and Feeding.** No details of diet. Forages on ground and in shrub layer, ascending higher into shrubs than do congeners. Gleans from leaves and stems; bounds rapidly from perch to perch while making scolding calls.

**Breeding.** Poorly known; data from only two nests. One nest collected in Dec, a rounded domed structure with side entrance near the top, made of a springy mass of fine dark rootlets (possibly tree-ferns) with some minute moss fragments and a few twigs and feathers, inner cup of lengths of grass or bamboo-like leaves, lined with similar but finer material and a few downy feathers, was attached to bush branch c. 46 cm above ground. Clutch 2 eggs, white and almost unmarked or with fine light purple-grey markings at larger end (and more sparsely elsewhere). No further information available.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. In general, a rather rare and poorly known species, reported as locally not uncommon in a few areas, occupying limited altitudinal zone. Occupied range quite wide, 50,000–100,000 km<sup>2</sup>; sparsely distributed, and has probably always occurred at low density. Except for local logging and clearance for farms, habitat unlikely to suffer too severely.

**Bibliography.** Beecher *et al.* (1986), Close *et al.* (1982), Coates (1990), Coates & Peckover (2001), Finch (1980), Gyldenstolpe (1955a), Harrison & Frih (1970), Rand & Gilliard (1967), Salvadori (1896), Stresemann *et al.* (1934).



## 6. Mountain Mouse-warbler

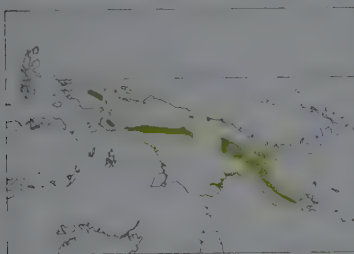
### *Crateroscelis robusta*

**French:** *Séricorne robuste* **German:** Braunbauch-Waldhüschchen **Spanish:** *Acanthiza Robusta*  
**Other common names:** High-mountain/White-throated Mouse-warbler, Mountain Mouse-babbler

**Taxonomy.** *Gerygone robusta* De Vis, 1898, Wharton Range, south-eastern New Guinea. Races form two groups, *sanfordi* and *bastille* brown below and the other four having grey underparts; whether groups differ vocally, however, is not known. Proposed race *pratti* (Mt Dayman, extreme SE New Guinea) normally merged with nominate. Six subspecies recognized.

#### Subspecies and Distribution.

*C. r. riplei* Mayr & Meyer de Schauensee, 1939 – Vogelkop (Tamaru Mts), in NW New Guinea.  
*C. r. peninsularis* E. J. O. Hartert, 1930 – Arfak Mts, in Vogelkop (NW New Guinea).  
*C. r. sanfordi* E. J. O. Hartert, 1930 – W New Guinea from Wandammen area, and Weyland Mts and Snow Mts, E to Jayawijaya Mts, Victor Emanuel Mts and Hindenburg Mts.  
*C. r. deficiens* E. J. O. Hartert, 1930 – N New Guinea (Cyclops Mts).  
*C. r. bastille* Diamond, 1969 – N New Guinea (Bewani Mts, Torricelli Mts).  
*C. r. robusta* (De Vis, 1898) – E & SE New Guinea from Huon Peninsula (Saruwaged Mts), Sepik Mts and Herzog Mts E to Owen Stanley Range.



**Descriptive notes.** 12 cm. Small, dumpy, quite short-tailed and long-legged brownish skulker of the undergrowth at high altitude. Male nominate race is dark brown above, including upperwing and tail, with rufous wash on uppertail-coverts; chin and throat white, broad breastband and flanks grey-brown or dark brown, belly greyish-white; iris white, straw-coloured, pinkish, orange or orange-brown; bill brown; legs grey-brown. Female is similar to male or duller. Juvenile resembles adult, but underparts can be reddish-brown or grey-brown, iris dark brown or grey-brown. Races vary markedly in colour and pattern, with two

broad groups, those with grey underparts and those without: *deficiens* resembles nominate but deeper brown above, uppertail-coverts less rufous, underparts greyish, lacks slaty breastband; *peninsularis* is like previous, but more white on breast; *riplei* is like last, but greyish-toned, less rufous-brown, above; *sanfordi* is slightly larger, rich brown to olive-brown above, dull rufous-brown below (more like *C. murina* but duller); *bastille* is like last, but upperparts dull dark olive, underparts slightly paler, with less contrast between light throat and darker breast and belly. Voice: Song of fluty tones varied with harsher notes, often gives song phrase of 3 or 4 notes, "tit teet too", a rising "chee chee chee chee", and a throaty, bubbling "chevoo chu chu chu" series; similar to song of *C. murina* but with more harsh notes and greater variety of calls. A remarkable mimic, though not often reported (perhaps unrecognized as such); one individual (near Tari Gap) gave perfect imitation of call of Hooded Cuckoo-shrike (*Coracina longicauda*). Alarm a buzzing "chee" and a harsh short "trrt trrt".

**Habitat.** Mountain forest, at c. 1250–3680 m; inhabits dense shrubby understorey of moss forest, occurring also in coarse kunai grass (*Imperata*) along forest edge, and in overgrown treefall areas. Becomes commoner at higher elevations, e.g. at 1645 m on Mt Karimui, but tails off as vegetation becomes dwarfed nearer tree-line. Replaced at lower elevations by *C. murina*. Narrow zone of overlap with both latter and *C. nigrorufa* in a few areas; ecological-separation mechanism unknown, but presumably through niche selection, with present species between mainly terrestrial *C. murina* and higher-foraging *C. nigrorufa*.

**Food and Feeding.** Insectivorous; no details of dietary items. Usually seen singly or in pairs, or in groups of three or four individuals, probably family parties. Forages on ground and substage; creeps quietly through vegetation, easily overlooked unless calling. Often skulking but sometimes quite approachable, heard far more often than seen. Hops on ground and through shrubs, gleaming food items; will feed on narrow shady tracks adjacent to thick cover.

**Breeding.** Few data. Nestlings reported in Dec and fledgling seen in Aug. Domed nest similar to that of *Sericornis*, lined with feathers; sites include under tree roots, in fork of small tree, under small cliff and in a landslip area. No other information.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Common and widespread over most of mountain areas of New Guinea. Has a large range, with estimated global extent of occurrence of 50,000–100,000 km<sup>2</sup>. No obvious threats in most of range, localized loss of habitat through logging and clearance for gardens.

**Bibliography.** Beecher *et al.* (1986), Coates (1990), Coates & Peckover (2001), Diamond (1988), Englis & Coe (1997), Gilliard & LeCroy (1961a), Gylsdensiope (1955a), Junge (1953), Majne & Bulmer (1977), Mayr & Gilliard (1954), Mayr & Rand (1937), Rand & Gilliard (1967), Stresemann *et al.* (1934).

## Genus *SERICORNIS* Gould, 1838

## 7. Yellow-throated Scrubwren

### *Sericornis citreogularis*

**French:** *Séricorne à gorge jaune* **German:** Gelbkehlsericornis **Spanish:** *Sedosito Gorjigualdo*  
**Other common names:** Lemon-throated Scrubwren, Yellow-throated Sericornis, Yellow Throat

**Taxonomy.** *Sericornis citreogularis* Gould, 1838, New South Wales, Australia. Distinctive N race, *cairnisi*, smaller and with different vocalizations, reportedly has high level of genetic divergence from S races; conceivably a separate species. Race *intermedius* intergrades with nominate and often synonymized with it. Three subspecies recognized.

#### Subspecies and Distribution.

*S. c. cairnisi* Mathews, 1912 – Atherton-Windsor uplands of NE Queensland, in NE Australia.  
*S. c. intermedius* Mathews, 1912 – SE Queensland (Burra Mts) S to NE New South Wales (to Clarence drainage).  
*S. c. citreogularis* Gould, 1838 – coastal New South Wales E of Great Dividing Range (from Clarence drainage S to Mt Dromedary).



**Descriptive notes.** 12–15 cm; male c. 18 g, female c. 16 g. A fairly large and quite long-tailed scrubwren, with legs looking disproportionately long and quite stout. Male nominate race has crown to hindneck and side of neck brown to olive-brown, narrow pale supercilium grading from white in front of eye to yellow behind eye, lower forehead and short coronal stripe black, distinctive black mask from forehead to ear-coverts, contrasting pale yellow chin and throat, upperparts brown, with russet-brown rump and tail; upperwing olive-brown, diagnostic black centres of outer few median coverts (chain of 4–5 black spots running inwards from shoulder), most primaries edged light greenish-yellow (forming pale wingpanel), blackish alula; underparts yellowish-white, grading to white on belly centre, vent and undertail-coverts, extensive brownish wash on breast side and flanks, sometimes some faint dark smudges across centre of breast (on some forming variable band across middle to lower breast), sometimes pale yellow of throat washes into breast; undertail dark brownish-grey; iris crimson or plum-coloured; bill black; legs pinkish-brown to pale pink, flesh-coloured or whitish-buff. Female is similar to male but has less contrasting head pattern, with brown to olive-brown forehead, duller olive-brown mask, rear supercilium often whiter, dark coronal stripe only faint, may have warmer brown wash across breast. Juvenile is similar to female, but upperparts warmer dark cinnamon-brown, lacking olive tones of adult, darker brown mask (young male), iris dark brown or greyish. Race *intermedius* is very similar to nominate, but brown colour below less warm in tone, less yellow on belly; *cairnisi* is distinctive, c. 10% smaller than others, with proportionately shorter tail, plumage darker above, breast of male more suffused olive-brown, centre of belly very pale yellow, or off-white; female often more mottled on belly. Voice: Song mainly in breeding season, in S of range (nominate race and *intermedius*) a pleasant sweet warbling series which may be interspersed with rattly phrases, also accomplished mimicry; female sings and mimics but seems quieter than male; one party of four individuals mimicked 26 species, another male during c. 30 minutes mimicked two members of present family (*S. frontalis*, *Gerygone mouki*), Crimson Rosella (*Platycercus elegans*), Eastern Rosella (*Platycercus eximius*), Lewin's (*Meliphaga lewinii*), Scarlet (*Myzomela sanguinolenta*) and Yellow-faced Honeyeaters (*Lichenostomus chrysops*), Eastern Spinebill (*Acanthorhynchus tenuirostris*), Eastern Yellow Robin (*Eopsaltria australis*), Eastern Whipbird (*Pachycephala pectoralis*), Golden (*Pachycephala pectoralis*) and Rufous Whistlers (*Pachycephala rufiventris*), Black-faced Monarch (*Monarcha melanopsis*), Rufous Fantail (*Rhipidura rufifrons*), Cicadabird (*Coracina tenuirostris*), Silvereye (*Zosterops lateralis*) and Superb Lyrebird (*Menura novae-hollandiae*); two pairs mimicked song of captive Island Canary (*Serinus canaria*). N race *cairnisi* has slower, less sweet, shorter whistled "tee too whee too widdy teet" series; mimicry not reported from this race, which has appears less vocal than S races. All races have repetitive harsh, scolding rattling alarm call, similar to that of *S. frontalis* but deeper-toned; sharp "tuck" also given as alarm; one contact call of S races is trisyllabic "pit pit pit", also a high-pitched nasal whistle.

**Habitat.** Gloomy understorey of coastal temperate to montane subtropical rainforests, eucalypt (*Eucalyptus*) woodlands and vegetated gulleys. Often along watercourses with grey myrtle (*Backhousia myrtifolia*), coachwood (*Ceratopetalum upetalum*) and yellow sassafras (*Doryphora sassafras*), also in warm temperate lilly pilly (*Aenena smithii*) gully rainforest, and in thickets with red cedar (*Toona australis*), sandpaper fig (*Ficus coronata*), Port Jackson fig (*Ficus rubiginosa*), black plum (*Diospyros australis*) and white cedar (*Melia azedarach*) with vines and emergent sclerophyllous trees. In NE New South Wales, occurs in wet sclerophyll forest with blackbutt (*Eucalyptus pilularis*), flooded gum (*Eucalyptus grandis*), tallow-wood (*Eucalyptus microcorys*) and brush box (*Lophostemon confertus*) with rainforest emergents and many vines. Will use thickets of exotics such as lantana (*Lantana*) and blackberry (*Rubus fruticosus*) surrounded by cleared land, but usually near vegetated creeklines; also dense camphor laurel (*Cinnamomum camphora*) and small-leaved privet (*Ligustrum sinense*) thicket. Occurs from coast to tablelands of Great Divide; in NE Queensland (race *cairnisi*), uplands from 300 m (Kuranda) to 1300 m.

**Food and Feeding.** Primarily insectivorous, but also takes seeds, fungi and fruit. Takes worms (Oligochaeta), spiders (Araneae) and cockroach eggs (Blattodea), also beetles (Coleoptera, including curculionids), moths and caterpillars (Lepidoptera), termites (Isoptera), flies (Diptera), bugs (Hemiptera), plant lice (Psyllidae), ants (Formicidae), ichneumonids (Ichneumonidae) and other hymenoptera, orthopterans, and eggs of Phasmatodea; plant seeds eaten include those of genera *Chenopodium*, *Acacia* and *Phytolacca* and of families Asteraceae, Fabaceae and Rutaceae. Forages singly or in pairs, sometimes in small family groups; readily joins mixed feeding flocks with *S. frontalis*, Eastern Yellow Robin, Rufous Fantail and Eastern Whipbird. Forages mainly on ground among leaf litter, mossy rocks and fallen branches and logs. Gleans opportunistically as it hops along forest floor, but will also search methodically by probing and scratching forest floor, and occasionally sallies for prey. Will follow Australian Logrunners (*Orthotomus sutorius*) and take food disturbed by their scratching; does the same with both Albert's (*Menura alberti*) and Superb Lyrebirds. May become tame and approach walkers, or forage by picnic tables.

**Breeding.** Season Aug–Mar, with eggs recorded Aug–Feb; one or two broods. Breeds as pair; rarely, a third individual seen to visit nest but without helping. Defends territory against intruders by scolding calls and agitated behaviour, in particular driving off young male conspecifics. Nest construction may take c. 11–19 days, will rebuild if nest destroyed; slender, domed and pendulous structure with hooded side entrance, made of blackish rootlets, palm fibres, skeletonized leaves, twigs, ferns, moss and lichens, in SE Queensland sometimes rootlet-like horsehair fungus (*Marasmius*) mixed with moss and twigs, nest usually well lined with soft material such as feathers from rosellas and lyrebirds and soft grass; average external diameter 19.2 cm, external length 34.2 cm, entrance 3.8 cm, suspended from vines, tree roots exposed in bank, or outer branches of shrub or tree, from less than 1 m to up to 12 m above ground, often over water, in damp shady area or by track; will use same site (but rarely same nest) for years, such that clusters of old nests common. (Incub 2–3 eggs, very variable, often white to creamy buff to pinkish-brown, with dark streaking piercing into bands of dark wash at larger end; incubation by female, period 12–14 days, hatched by both adults, latter may attempt to fend intruders away by scolding and flitting through undergrowth, nestling period c. 3 weeks; fledglings often bundle together for first 6–9 days, moving between roosts on fallen branches or logs under dense vegetation; male parent sometimes continues care of young while female commences second brood, sometime independent after 48–49 days, most have left natal area by first autumn. Nests occasionally parasitized by variegated Cuckoo (*Cacomantis flabelliformis*), Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Shining Bronze-cuckoo (*Chrysococcyx lucifer*), parasitism by Black-eared Cuckoo (*Chrysococcyx flabelliformis*) also reported, but little overlap with this species. Nests often appropriated by *myiophobus*, and *Acanthiza thornbills* reported as taking over nests at times. Recorded longest incubation period 12–14 days, 8 months.

**Movements.** Resident. Severe droughts may cause local wandering.



**Status and Conservation.** Not globally threatened. Common within disjunct E Australian range in Queensland and New South Wales. Well represented in national parks and reserves.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Christidis & Boles (1994), Christidis *et al.* (1988), Geering (1992a, 1992b), Hall (1974a), Higgins & Peter (2002), Joseph *et al.* (1995), Keast (1978c), Kikkawa *et al.* (1965), Marshall (1930), Mayr (1937), McGill (1970), McNamara (1946b), Morcombe (2003), Moritz & Faith (1998), Nielsen (1996), North (1904), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Wieneke (1992a).

## 8. White-browed Scrubwren

### *Sericornis frontalis*

**French:** Sérécorne à sourcils blancs

**Spanish:** Sedosito Cejiblanco

**German:** Weißbrauensericornis

**Other common names:** (Brown) Scrubwren; Spotted Scrubwren ("maculatus group"); Buff-breasted/Pale-breasted Scrubwren (*laevigaster*)

**Taxonomy.** *Acanthiza frontalis* Vigors and Horsfield, 1827, region of Sydney, New South Wales, Australia.

Closely related to, and often treated as conspecific with, *S. humilis*; Bass Strait populations (race *flindersi*) apparently represent intermediates, and King I race *tregellasi* of latter species sometimes included in present species; genetic studies required in order to clarify relationships and help in defining species boundaries. Appears to be closely related also to *S. kerri*, which has probably hybridized with race *laevigaster* and may be a fairly recent divergence. Otherwise, races of present species form three broad groups, "nominative group" (containing also *tweedi*, *harterti*, *rosinae* and *flindersi*), *W "maculatus group"* (also with *balstoni*, *ashbyi* and *mellori*) and single-species NE "*laevigaster group*"; plumage and vocal differences suggest that these could perhaps be treated as three distinct species, but *laevigaster* intergrades with *tweedi* over a 100-km zone in S Queensland and N New South Wales, and in South Australia *mellori* probably intergrades with *rosinae* around Gulf St Vincent prior to foundation of metropolitan Adelaide (intergrades from this area described as taxon *osculans*). Additional proposed races are *longirostris* (from coastal parts of SE South Australia), synonymized with nominate; in Bass Strait, *gularis* (Kent Group) and *insularis* (from nearby Forsyth I.), evidently intermediates between nominate and *flindersi* and merged with latter; and *mondraeni* (Archipelago of the Recherche, in Western Australia), merged with *mellori*. Ten subspecies currently recognized.

#### Subspecies and Distribution.

*S. f. balstoni* Ogilvie-Grant, 1909 – coastal W Western Australia from Shark Bay and its islands S, including Houtman Abrolhos, to Dongara-Jurien Bay region.

*S. f. maculatus* Gould, 1847 – SW Western Australia (from Dongara S to Bremer Bay–Hopetoun region).

*S. f. mellori* Mathews, 1912 – S Western Australia (from Bremer Bay–Hopetoun, and extending N patchily to inner wheatbelt) E along coast, including Archipelago of the Recherche, to SE South Australia (E to S Yorke Peninsula and coastal Gulf St Vincent).

*S. f. ashbyi* Mathews, 1912 – Kangaroo I, off South Australia.

*S. f. laevigaster* Gould, 1847 – NE Queensland (S from Cairns and Atherton Tablelands) S to NE New South Wales and to W slopes of Great Dividing Range.

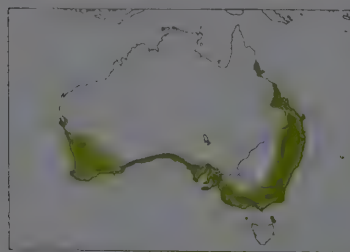
*S. f. tweedi* Mathews, 1922 – coastal and subcoastal areas from Queensland–New South Wales border S to R Hunter and inland to W slopes of Great Dividing Range.

*S. f. frontalis* (Vigors & Horsfield, 1827) – coastal and subcoastal area from EC New South Wales (R Hunter and inland to W slopes of Great Dividing Range) S, except in S Victoria, to E coast of South Australia.

*S. f. harterti* Mathews, 1912 – coastal S Victoria (around Cape Otway and E to Wilson's Promontory).

*S. f. rosinae* Mathews, 1912 – Mt Lofty Ranges, in South Australia.

*S. f. flindersi* S. A White & Mellor, 1913 – islands in E Bass Strait (Hogan, Kent and Furneaux Groups).



**Descriptive notes.** 10.5–15 cm; c. 14 g. Highly variable medium-sized scrubwren with distinctive head pattern and comparatively short legs. Male nominate race has lores and ear-coverts black (forming broad mask), bordered by bold but narrow white supercilium (fading behind eye) and by broad white submoustachial stripe; narrow white suborbital line; black of forehead extends back as narrow coronal band along upper edge of supercilium to just before eye; deep olive-brown above, greyer on crown and with russet wash on lower back to uppertail-coverts; uppertail olive-brown, washed rufous-brown, sometimes (in S of range) with faint dusky subterminal band; obvious black shoulder patch formed by alula, greater primary coverts and a few greater secondary coverts, thin whitish tips on alula and upwings-coverts (faint pale wingbars sometimes visible on greater and median coverts), remiges edged brownish to ashy grey (forming diffuse pale primary panel); throat whitish, variably spotted blackish, underparts creamy to pale yellowish, chest side grey, flanks washed rufous-brown, often some faint dark streaks on breast side, iris pale orange or light yellow to creamy or pinkish-white; bill black, often brownish on cutting edges, merging into creamy base of lower mandible; legs pinkish-brown to dark brown, soles creamy. Female is somewhat duller than male, with less contrasting facial pattern, lores greyish or brownish. Juvenile is duller than female, pattern more diffuse, black on forehead further reduced or lacking, underparts with distinct brownish wash, alula greyish-black (contrasts with black greater coverts), throat streaks lacking, chin to lower breast washed grey-brown (contrasting with pale creamy or yellowish belly), richer rufous-brown wash on flanks extending to undertail-coverts, iris much darker, greyish, immature as adult, but may show buffish wingbar on greater coverts. Races differ significantly, mainly in plumage tone and pattern, also in biometrics: *tweedi* is very like nominate but has somewhat shorter tail, slightly longer supercilium, more clearly defined submoustachial stripe, throat usually less heavily streaked, brighter yellow below, *harterti* has darker upperparts and richer yellow underparts than nominate, also longer bill; *rosinae* is slightly bigger than nominate, ear-coverts a little less dark, upperparts without rufous tinge, breast usually streaked; *flindersi* is very like nominate, but male lores usually greyer (less black), appears intermediate in some ways between nominate and *S. humilis*; *laevigaster* male has slightly more extensive black on forehead, white supercilium somewhat broader and longer than in others, lacks white suborbital line, upperparts paler and greyer, prominent dark subterminal tailband and white tips on outer rectrices; very pale iris, very white below, throat and breast unstreaked, no grey on side of chest, iris usually quite bright orange; *maculatus* is smaller than nominate, upper forehead to nape

paler, supercilium longer and slightly broader, pale suborbital line thicker and more contrasting, upperparts slightly paler and russet cast faint or lacking, tail as previous, throat whitish with heavy dark streaks, mostly yellow below, breast with bold dark spots or streaks; *balstoni* is similar to last, but has slightly longer tail, paler overall, throat and underparts white, streaking less heavy, pale buff crissum, iris often off-white or pale greyish; *mellori* is also very similar, but paler, grey-brown above (never any rufous tinge), whitish below, spots and streaks variable (often heavy), flanks brown, iris as previous; *ashbyi* closely resembles last, but bill longer, top of head darker, upperparts darker, brown on flanks usually darker and more extensive (reaching breast side). Voice. Very vocal. Loud song variable, musical or harsh, usually of 5–20 multi-note "syllables" at rapid pace, e.g. "tseer, whee-u, seet-yu, whee-a-chee, whee-whee-whee-de-de" and variants; loud song and twittering given during interactions at territory boundaries. Males can sing more than one song type, and males may have different repertoires. Females and subordinate males reportedly sing, and both sexes have soft subsong. Call varies geographically, but most, if not all, races have dry, staccato, rattly scolding "tzz tzz tzz" alarm and soft contact notes, both similar to those of *S. citreogularis*; trilling high-pitched alarm in response to flying predators; during foraging, group-members in constant vocal contact with soft calls when close together, louder ones when separated. Nominative race has rather metallic-sounding rapid "wip wip tscheep tscheep tscheep" repetitive call; *tweedi* "wicity wit-diddy wit diddy wit diddy" and squeaky disyllabic notes; *laevigaster* rapid chattering "tchee tchee tchip-tchip-chip" series; *mellori* rapid rather clinking "chip wee" series and "wicity wicity wid tsip we we"; *maculatus* rapid "cheep oo cheep oo cheep oo" and "sip sip sip" calls, also "widdy-dit widdy-dit" series similar to those of *mellori* and *tweedi*. Creaking sounds given around nest-sites and when using freeze posture in territorial interactions; female emits soft "sip" food-begging call (similar to nestling call).

**Habitat.** Dense undergrowth in diverse habitats, including eucalypt (*Eucalyptus*) forest, rainforest, mallee, coastal heathlands, sand dunes and inland sandplains. Will occupy thickets of *Lantana* (*Lantana*), blackberry (*Rubus fruticosus*) or other exotics, and occupies disturbed areas so long as sufficient cover remains; adapts well to pine (*Pinus*) plantations, particularly as ground cover increases with age. Recorded occasionally at mangrove edges, and often in suburban parks and gardens; may become tame and enter buildings or vehicles. Likes gulleys and watercourses. Sympatric with *S. citreogularis* in temperate rainforest of Queensland and N New South Wales; occurs around edges of rainforest in wet tropics of Queensland, replaced by closely related *S. kerri* in denser interior. From sea-level to c. 1830 m.

**Food and Feeding.** Food arthropods, especially insects; also seeds and fruit. Recorded prey items include gastropods and a wide range of arthropods, including, among others, spiders (Araneae), scorpionids, cockroach eggs and adults (Blattodea), beetles (of families Carabidae, Chrysomelidae, Curculionidae, Cleridae, Elateridae, Hydrophilidae, Staphylinidae, and others), flies (Diptera), bugs (Hemiptera), bees (Apidae), ants (Formicidae) and other hymenopterans, lepidopterans, orthopterans and Phasmatodea. Many weed seeds taken, e.g. those of genera *Rubus*, *Medicago*, *Oxalis*, *Geranium*, *Chrysanthemum*, *Plantago*, *Rumex* and *Chenopodium*. Usually in pairs or small groups. Forages both arboreally and, especially, on ground, in or below dense vegetation in wide variety of habitats, including damp ground near water, ferns, grasses, shrubs, vines, low branches and fallen timber; sometimes climbs trunks, and may ascend to canopy of small trees or tall shrubs; sometimes forages on snow in lower alpine zone, and often on forest tracks in SE Queensland. Forages mainly by gleaning, but also by probing and sallying, and by flicking aside fallen leaves, and intensively examining woody debris and leaf litter. Moves in short hops and low flights. A frequent member of mixed feeding flocks, in SE Queensland including those with *S. citreogularis*, *Gerygone mouki*, Eastern Yellow Robin (*Eopsaltria australis*), Eastern Whipbird (*Psophodes olivaceus*) and Rufous Fantail (*Rhipidura rufifrons*); in Western Australia, associates with Blue-breasted (*Malurus pulcherrimus*), Splendid (*Malurus splendens*) and Variegated Fairy-wrens (*Malurus lamberti*), also with *Acanthiza apicalis* and *Acanthiza uropygialis*. Feeding associations noted with Superb Lyrebird (*Menura novaehollandiae*), and may join *Pycnopsittacus floscosus* in collecting food from areas picked over or disturbed by the larger bird; also seen to feed in the wake of Albert's Lyrebird (*Menura alberti*) and of Australian Logrunner (*Orthonyx temminckii*), exploring their scratching sites for food items.

**Breeding.** Recorded in all months, but mainly Aug–Jan; several broods in a season. Mating system includes monogamy and polyandry within social groups, dominant male siring 76% of young in one study, such males guarding female during fertile periods. Breeds as simple pair, or as cooperative group consisting of breeding female, dominant male and up to four subordinate helpers (usually progeny from previous broods or siblings, though wandering birds sometimes adopted); in study in Canberra (Australian Capital Territory), 46% as simple pairs, 44% with one adult subordinate and 7% with two; subordinates may help to raise nestlings, and assist in nest sanitation and in guarding territory (doing so mostly when they had themselves sired young), and helpers may shorten time between nesting attempts (from 27 days to 16 days in one study); overall nesting success seems to benefit from presence of helpers primarily when nesting female is inexperienced (reproductive success of such groups twice that of those nesting in pairs). Strongly territorial, vigorously defends permanent territory. Nest domed, with rounded and slightly hooded side entrance, made of loose grass, twigs, fine roots and leaves, lined usually with feathers and/or hair, sometimes with fine plant material, external diameter 8–15 cm, length c. 12.5–15 cm; well hidden in sheltered site in bank, tree hollow, among roots, undergrowth, ferns or grass, or in outhouse, most on ground or low in tussock or shrub, or often in artificial site (flower pot, bucket, basket), some odd sites including crash helmet, kerosene tin, potato sack and generator; territory size dependent on habitat, e.g. c. 1 ha in wet gulleys in Canberra, 1.8 ha in other Canberra sites, 2.63 ha at Shark Bay (Western Australia). Clutch 2–3 eggs, grey-white to pale buff with dark brown, black or purple blotches and spots, these forming cap at large end; incubation by female, usually sitting tightly, incubation period 17–22 days in Canberra, 15–20 days elsewhere; chicks brooded by female, rarely by male, fed by both parents and by any helpers present, nestling period in Western Australia reported as 12–13 days for communal groups and 13–14 days for simple pairs, mean in Canberra 15 days (with no difference between groups and single pairs); distraction displays to lure predators from nest include injury-feigning (broken wing), and perching atop shrubs while singing and flicking wings and tail, sideways swaying of body; young fed by adults for 6–7 weeks after fledging, stay on territory for a further 4 weeks and often longer; dispersal age of juveniles varies with year and sex, females dispersed after average of 75 days in 1996 but 153 days in 1997, and some males remained as subordinate adults but others dispersed c. 5 months after fledging. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Black-eared Cuckoo (*Chrysococcyx osculans*). For 246 nests in Canberra study, hatching success 71%, 30–2% of hatchlings fledged and 14–6% reached independence; over seven-year study, seasonal average of 1.9 fledglings reared per female and mean of 1.4 young per season for successful females. Survival high after first week, e.g. of 641 young from 259 broods, 448 (69.9%) survived one week after fledging and 381 (59.4%) reached independence, recorded longevity in ringing studies at least 16 years ± months.

**Movements.** Resident, with some local wandering, may make local altitudinal shifts in highlands of SE Australia. Young and non-breeders disperse, but usually not far; of 352 ringed individuals in Western Australia, none moved farther than 2 km.



**Status and Conservation.** Not globally threatened. Often common within its large range in E, S & SW Australia outside desert and semi-arid zone. Able to thrive in a wide range of vegetated habitats. Locally vulnerable to fire, land clearance, and predation by feral animals (cats), but considered secure overall.

**Bibliography.** Ambrose (1984), Ambrose & Davies (1989), Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker, M.G. (1998b), Carter (1924b), Christidis & Holes (1994), Christidis & Schodde (1991a, 1991b), Christidis *et al.* (1988), Ford, H.A. (1985), Ford, J.R. (1985), Frith (1969), Green (1980), Hall (1974a), Higgins & Peter (2002), Hughes & Hughes (1978), Joseph & Moritz (1993b), Joseph *et al.* (1993), Keast (1978c), Levesley & Magrath (2005), Leedman (2000), Leedman & Magrath (2003), Magrath (2001), Magrath & Whittingham (1997), Magrath *et al.* (2000), Mayr (1937), McCarthy (2006), McGill (1970), Morecombe (2003), Nielsen (1996), North (1904), Pizzey *et al.* (2005), Platzen & Magrath (2005), Rutkowski & Rutkowski (1980), Sanders *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Sutton (1927), Whittingham & Dunn (1998), Whittingham *et al.* (1997).

## 9. Tasmanian Scrubwren

### *Sericornis humilis*

**French:** Séricorne brun **German:** Tasmansericornis **Spanish:** Sedosito Pardo  
**Other common names:** Brown Scrubwren, Brown/Tasmanian Sericornis

**Taxonomy.** *Sericornis humilis* Gould, 1838, Van Diemen's Land = Tasmania.

Closely related to, and often treated as conspecific with, *S. frontalis*; Bass Strait populations of scrubwrens apparently intermediate between the two, and race *tregellasi* sometimes included in latter species; also, birds resembling race *flindersi* of *S. frontalis* have been recorded in far NE Tasmania, probably reflecting contact with mainland Australia during last glacial epoch; genetic studies required in order to clarify relationships and help in defining species boundaries. Two subspecies recognized.

**Subspecies and Distribution.**

*S. h. tregellasi* Mathews, 1914 - King I (W Bass Strait), off SE Australia.

*S. h. humilis* Gould, 1838 - Tasmania and inshore islands.

**Descriptive notes.** 12.5–14.5 cm; 14.5–21.5 g.

Medium-sized brown scrubwren with relatively indistinct head pattern and with extensive streaking below. Male nominate race has indistinct black lateral crownstripe from lower forehead to forecrown, pale supercilium and submoustachial stripe, blackish lores and grey ear-coverts (forming indistinct mask); dark olive-brown above, including upperwing and tail, darker grey on neck side, with warmer russet back, rump and uppertail-coverts; white-edged black shoulder patch formed by alula and greater primary coverts with a few outer secondary coverts; chin and throat off-white



with coarse dark streaks or spots; underparts dull cream, slightly yellower in belly centre, with dark brownish wash on flanks and breast side, diffuse dark grey streaking on breast and upper belly; iris pale yellow to orange-buff; bill black, dull brown base of lower mandible; legs light greyish-brown to pink, soles creamy. Differs from similar *S. frontalis* in darker and less well-marked plumage, much browner general appearance, duller and less contrasting head pattern. Female is similar to male but much duller, with head pattern less prominent (with fewer contrasts), streaking on chin and throat less distinct. Juvenile resembles female but has even duller face pattern, chin and throat unstreaked cream to pale grey, breast uniformly grey-brown, contrasting with pale cream or greyish belly, rich rufous-brown wash on flanks to undertail-coverts, buffish wingbar, soles of feet brighter yellow; iris described as brownish-cream, may gain adult colour at c. 1 year of age. Race *tregellasi* is brighter yellow and less streaked below than nominate, with brown flanks more contrasting. **VOICE.** A high-pitched sibilant "tschwee-tschwee-tschwee", uttered in repetitive series, resembling vocalizations of nearby *S. frontalis* (of race *frontalis*), but higher-pitched; and a scolding rattled "chwee chwee", again recalling *S. frontalis*. Also, a soft "peep" used as a contact call, and a "chip" squeaky note.

**Habitat.** Requires dense understorey in temperate rainforest, wet and dry sclerophyll forest, woodland, paperbark (*Melaleuca*) swamp and coastal shrubland; has particular liking for densely vegetated moist gulleys. Occurs in antarctic beech (*Nothofagus cunninghamii*) forest, also tall wet sclerophyll with alpine ash (*Eucalyptus delegatensis*), messmate (*Eucalyptus obliqua*), black peppermint (*Eucalyptus amygdalina*) or blackwood (*Acacia melanoxylon*), also occupies tea-tree (*Leptospermum*) brush and heathland; less common in more open dry sclerophyll with Tasmanian yellow gum (*Eucalyptus johnstonii*), urn gum (*Eucalyptus urnigera*) and silver peppermint (*Eucalyptus tenuiramis*), where found mainly in vegetated gulleys and thick undergrowth; sometimes in subalpine areas with Tasmanian snow gum (*Eucalyptus coccifera*), and endemic conifer forests with shrub layer, also sedgelands, moors and wetlands. Sometimes in parks and gardens near forests, often in blackberry (*Rubus fruticosus*) thickets. Avoids burnt areas, but will recolonize when vegetation layer sufficiently regenerated. From sea-level to 800 m, rarely to 1220 m in treeless scrubland.

**Food and Feeding.** Feeds mainly on small invertebrates, but also takes some seeds. Insects include beetles (Coleoptera), also ants (Formicidae) and other hymenopterans, also cockroach (Blattodea) eggs, flies (Diptera), crane flies (Tipulidae), bugs (Hemiptera), and moths and caterpillars (Lepidoptera); spiders (Araneae) and other arthropods also taken, also worms (Oligochaeta). Seeds eaten include those of families Cyperaceae, Ericaceae and Poaceae, and of genera *Alfalfa*, *Cirsium*, *Senecio*, *Pultenaea*, *Geranium*, *Prunella*, *Oxalis*, *Anagallis*, *Ranunculus* and *Veronica*. Usually in pairs or small family groups. Mainly terrestrial, foraging among leaf litter, but also in dense middle-storey shrubs, ferns, tree ferns and lower branches of trees; sometimes feeds on ground in the open along tracks or in fields, but rarely far from cover. Inspects fallen trees and mossy logs. Gleans from ground, feeds also by probing, more often in summer than in winter, rarely seen to sally-strike or hang in the air.

**Breeding.** Season Jul–Feb. Appears to nest mainly as pairs, but subordinate helpers reported at some nests (may be less frequent than with *S. frontalis*, but further study required). Nest domed or nearly spherical, with circular side entrance, constructed of rootlets, grass, bark fibre, dead leaves and green moss, usually lined with feathers from such species as parrots (Psittacidae) or Bassian Thrush (*Zoothera montana*), also with bark and fine grass. When built and full, average external diameter 14 cm, height 19.1 cm, entrance hole diameter 3.5 cm; normally well hidden in dense cover on or near ground in dense shrub, tussock, sedge, tussock, dead branches and debris on ground, or base of tree, sometimes embedded in moss on ground and with only entrance visible. Clutch 2 or 3 eggs, pale purplish to purplish-white, with amber or purplish-brown markings, usually mainly on

larger end (where may form cap), sometimes almost pure white with a few marks on large end; incubation period 17 days (one record); no information on duration of nestling period; fledglings fed by both adults, also sometimes by helpers when present; parents may be bold in defence of young and come very close to observer, but distraction displays not yet reported. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Pallid Cuckoos (*Cuculus pallidus*).

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Tasmania IBA. Quite widespread and fairly common. Large-scale commercial forestry operations on Tasmania will destroy large areas of habitat and cause local losses until undergrowth regenerates. Impact on all native birds and mammals of industrial-scale spraying for control of weeds and insects unknown, but unlikely to be positive. This species is well represented in national parks and reserves.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Christidis & Holes (1994), Christidis *et al.* (1988), Green (1989, 1995), Higgins & Peter (2002), Keast (1978c), Mayr (1937), McGill (1970), Morecombe (2003), North (1904), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Watts (2002).

## 10. Atherton Scrubwren

### *Sericornis kerri*

**French:** Séricorne de l'Atherton **German:** Rotstirnsericornis **Spanish:** Sedosito del Atherton  
**Other common names:** Atherton Sericornis, Bellenden Ker Scrubwren

**Taxonomy.** *Sericornis magnirostris kerri* Mathews, 1920, South Peak, Mount Bellenden Ker, north-east Queensland, Australia.

Genetic studies suggest that this species is more closely related to *S. frontalis* than to superficially similar *S. magnirostris*, and possible that it developed from ancestral stock of former during a past dry glacial period. In addition, evidence exists of at least past hybridization between present species and *S. frontalis*, which come into limited contact and are segregated largely by habitat. Monotypic.

**Distribution.** Tablelands of NE Queensland, in NE Australia.

**Descriptive notes.** 11.5–14.2 cm; c. 12 g. A medium-sized, somewhat featureless and rather dark scrubwren with large-looking dark eye, spiky bill. Has crown and upperparts dark olive-brown, uppertail-coverts warmer, more russet-brown; face paler brown, often demarcated from crown by diffuse pale brownish line above eye (crown appearing as diffuse cap in good light); sometimes an indistinct narrow off-white lower eye-crescent visible (also, some individuals reportedly have diffuse brownish-white patch just above and behind eye); upperwing as back, faint short pale wingbar formed by tips of outer greater secondary coverts, but variable; uppertail dark brown; creamy buff below, flanks and undertail-coverts washed yellowish-brown, some individuals with marked yellow wash on chin, throat, central breast and belly (said to be more apparent in N populations); iris dark red or red-brown; bill black or dark brown, often pale base of lower mandible; legs flesh-pink to red-brown or dark brown. Distinguished from very similar *S. magnirostris* (by darker plumage, often slightly capped appearance, yellowish wash below (when present), also less heady-looking eye. Sexes alike in plumage, male larger than female. Juvenile is very similar to adult, but poorly known; yellow coloration of underparts may be associated with immaturity (as such birds seen while feeding with adults). **VOICE.** Poorly known. Song a repetition of "che-wee" notes. Calls include "sip-sip-sip", also low (twittering) notes; churring and buzzing notes in alarm.



**Habitat.** Rainforest, mainly on tablelands at 600–1600 m, but reported down to 420 m; in microphyll vine-fern thickets in N of range at Thornton Peak (1260 m). Occupies deep forest, but occurs also along edges.

**Food and Feeding.** Insectivorous; no detailed studies, but prey includes cockroach eggs (Blattodea), beetles (of families Carabidae, Elateridae, Curculionidae), flies (Diptera), wasps (Hymenoptera), ants (Formicidae) and grasshoppers (Orthoptera). Usually seen singly, in presumed pairs, or in small family groups of up to four individuals; active mostly in cooler parts of the day in wet tropics, with resurgence in late afternoon if weather permits. Spends a lot of time foraging on the ground, but also ascends to lower and middle levels up to c. 5 m. Turns over leaves, works leaf litter, and forages around buttresses and fallen trunks; gleans from leaves, stems and branches. More terrestrial than *S. magnirostris*, less likely to spiral up trunks than is latter; seems often more wary, moving quickly away from observer.

**Breeding.** Few data. Breeding reported Aug–Dec, laying Sept–Nov. Nest domed or ovate, with slightly hooded side entrance, made of leaves, leaf parts, stems, fern fronds and dry grass, with soft plant fibres and grass in inner part, lined with feathers and/or down at base, one had external measurements of 15 × 12.5 cm; site normally low down, one nest was concealed by grasses and ferns in bank at side of road, other sites include vertical roadside cutting, grass clump, ferns on rock in middle of creek, and potted ferns 0.3–0.6 m above ground (used for three consecutive years). Clutch 2 eggs, but few records; female known to incubate; no information on duration of incubation and nestling periods.

**Movements.** Sedentary; some purely local winter wandering may be expected in poor weather conditions.

**Status and Conservation.** Not globally threatened. Restricted-range species; present in Queensland Wet Tropics IBA. Rather uncommon. Well represented in national parks and reserves. Although not presently at risk, may in the longer term become threatened by climate modification, which could alter its limited habitat.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Holes & Longmore (1979), Christidis & Holes (1994), Christidis *et al.* (1988), Fairhead & Barker (1966), Hall (1974a), Higgins & Peter (2002), Joseph & Moritz (1993a, 1993b, 1994), Joseph *et al.* (1993a), Keast (1978), McCarthy (1993), McGill (1970), Morecombe (1985), Murray & Lamb (1982), Nielsen (1996), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Williams (1982).

## 11. Large Scrubwren

### *Sericornis nouhuysi*

**French:** Séricorne montagnard **German:** Bergsericornis **Spanish:** Sedosito Grande  
**Other common names:** Mountain/Noisy Scrubwren, Large Mountain Scrubwren, Large Mountain Sericornis



**Taxonomy.** *Sericornis arfakiana nouhuysi* van Oort, 1909, Heliwig Mountains, Oranje Range, New Guinea.

Part of a species group that also includes *S. virgatus*, *S. beccarii* and *S. magnirostra*. Race *adelberti* is intermediate between present species and *S. virgatus*, and sometimes placed with latter. Race *kingi* is intermediate with *monticola*. Six subspecies recognized.

#### Subspecies and Distribution

*S. n. cantans* Mayr, 1930 - NW New Guinea (mountains of Vogelkop).

*S. n. nouhuysi* van Oort, 1909 - W New Guinea (Wes-Jard Mts, Nassau Range, Snow Mts).

*S. n. stresemanni* Mayr, 1930 - Central Highlands of E New Guinea (Hindenburg Range E to Schrader Range and Wahgi valley).

*S. n. adelberti* T. K. Pratt, 1982 - NE New Guinea (Adelbert Mts).

*S. n. oorti* Rothschild & E. J. O. Hartert, 1913 - mountains of Huon Peninsula and Herzog Mts, in New Guinea.

*S. n. monticola* Mayr & Rand, 1936 - SE New Guinea (Wharton Range, Owen Stanley Range).



**Descriptive notes.** 11–15 (13–15 cm). A relatively large, long-billed montane scrubwren with noticeably rusty tinge on face. Nominative race has crown olive-brown, forehead and facial area buffy rufous; upperparts dark brownish-olive, upperwing and tail browner, edges of wing and tail feathers tinged rufous; dull buffy olive below, rufous tinge on chin and upper throat; iris red-brown or orange-brown; bill black or brownish-black; legs variable, pale flesh to dark brown. Differs from *S. papuensis* mainly in more rufous, less greenish, plumage tones and lack of subterminal tailband, from *S. perspicillatus* and *S. arfakianus* by noticeably

larger size. Sexes alike. Juvenile undescribed. Races distinguished by minor size and colour differences: *cantans* has rufous of face extending onto breast, greyer buff belly, rufous undertail-coverts, upperparts somewhat darker than in nominate; *stresemanni* has tail darker and less rufous than others, is distinctively yellowish-olive below, breast heavily washed or mottled with rufous or pale brown, flanks darker; *oorti* browner on head, tail and wings, more olive on back, buffy rufous on chin and sides of head, yellowish-olive underparts, more olive on flanks, rufous undertail-coverts; *monticola* similar to previous, but larger and with paler underparts. Voice. A characteristic musical descending chattering series, "wee-see wee-see wee-see", each second note at slightly lower pitch; also a different descending series, "sit ti tuwit, sit tu tuwit". Harsh scolding "chit" notes interspersed with musical piping "weet see see tu tu tu" and variations.

**Habitat.** Montane forest and adjacent secondary growth at 1400–3500 m, occasionally as low as 1200 m and up to 3750 m; in SE (race *monticola*) apparently mostly above 3000 m.

**Food and Feeding.** Arthropods; sometimes takes seeds, but no details recorded. Generally seen in small parties of four or five individuals in lower stages of forest, ranging at times to middle storey. Pokes about on mossy branches and trunks, also on vines and epiphytes; behaviour rather like that of an Australasian treecreeper (*Climacteris*) or a Blue-capped Ibis (*Ibis kowaldi*), but occupies lower levels. Gleans for items. Is perhaps a less active feeder than its sympatric smaller congeners, which often utilize smaller branches at higher levels in vegetation.

**Breeding.** Recorded Apr–Dec; seems to breed in both wet and dry seasons. Nest a bulky dome with side entrance near top, made of dry pandanus (*Pandanus*) leaves and rootlets with covering of coarse moss-like liverwort, ferns and decomposed fibres, lined with fine fibres and feathers, built in lower leaves of pandanus or in moss clump suspended from tree limb. Clutch 2 eggs, whitish, washed pale purplish-brown, with obscure dark markings capping large end and a few pale brown marks elsewhere; no information on incubation and nestling periods.

#### Movements

**Status and Conservation.** Not globally threatened. Common over a wide area of New Guinea. Much of this species' habitat lies in remote and inaccessible places.

**Bibliography.** Bechler *et al.* (1986), Christidis *et al.* (1988), Coates (1990), Coates & Peckover (2001), Gilliard & LeCroy (1961a, 1970), Gyldestolpe (1955a), Hartert *et al.* (1936), Junge (1953), Keast (1978c), Mayr (1931b, 1937), Mayr & Gilliard (1954), Mayr & Rand (1936, 1937), McCarthy (2006), Pratt (1982), Rand & Gilliard (1967), Stresemann (1921).

## 12. Perplexing Scrubwren

### *Sericornis virgatus*

French: Séricorne mystérieux

German: Sepisericornis

Spanish: Sedosito Variable

Other common names: Perplexing Sericornis

**Taxonomy.** *Crateroscelis virgata* Reichenow, 1915, Macanderberg, 600 m, middle Sepik River, New Guinea.

Part of a species group that also includes *S. nouhuysi*, *S. beccarii* and *S. magnirostra*. Often treated as conspecific with *S. beccarii*, and a number of as yet unnamed forms from Bomberai Peninsula (Fakfak Mts, Weyland Mts, etc.) and New Guinea (Mt Bosavi, L. Kutubu) may belong with either species; in other areas, however, the two seem to behave as separate species, replacing each other altitudinally with little or no overlap. Recent specimens from link between *S. beccarii* of lowlands and hills and *S. nouhuysi* of mountains; intergrades with former known from Mt Bosavi, where specimen from 750 m is a female from 12–13 m one specimen almost typical of present species and another intermediate between the two (most resembling *beccarii*); specimen from 1450 m on nearby Mt Sisa is also intermediate, but closer to present species. Genetic and vocal studies required in order to unravel relationships within this complex of poorly known taxa. Five subspecies currently recognized.

#### Subspecies and Distribution

*S. v. imitator* Mayr, 1937 - NW New Guinea (Arfak Mts).

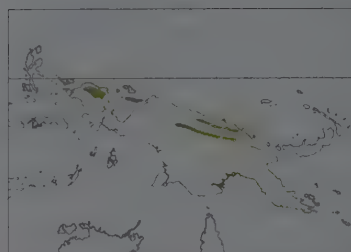
*S. v. johaniensis* Stresemann & Paludan, 1932 - Yapen I, in Geelvink Bay (NW New Guinea).

*S. v. boreonesioticus* Diamond, 1969 - NE New Guinea (Bewani Mts, Torricelli Mts, Prince Alexander Range).

*S. v. pontifex* Stresemann, 1921 - Victor Emanuel Mts, Hunstein Range, and Sepik Mts (Lordberg), in NC New Guinea.

*S. v. kingi* Reichenow, 1915 - N slopes of Sepik-Ramo drainage, in NE New Guinea.

**Descriptive notes.** 11–15 cm. Medium-sized scrubwren of montane and hill forest. Nominative race is typically greenish-olive above, browner on crown and tail, with forehead, supraloral area (paler), side of head and chin ochraceous or buffy rufous; alula and greater and median wing-coverts often with white or grey tips; underparts buffy white or buffy olive, sometimes with lemon wash on belly; iris orange-brown, reddish or brown; bill brown to blackish; feet horn-coloured. Sexes alike. Juvenile undescribed. Races vary in size and coloration: *imitator* similar to nominate but greener



above, darker below; *johaniensis* like previous, but darker ochraceous cinnamon on forehead and face, darker and less olive above, paler below; *pontifex* has pale tips of alula and coverts indistinct (greenish-grey) or lacking, bill sometimes entirely pale; *boreonesioticus* sometimes has pale lower mandible. Voice. Poorly known. Song possibly a rapid repetition of several short, high-pitched notes, similar to that of *S. nouhuysi* but less compressed, higher-pitched and with fewer notes; one call described as scolding raspy note similar to that of Black Monarch (*Monarcha axillaris*).

**Habitat.** Lower montane and hill forest and secondary growth, from 600 m (nominate race) to 1520 m (Mt Bosavi).

**Food and Feeding.** Food details not recorded but insectivorous, taking wide variety of arthropods. Usually seen in apparent pairs or in small family groups of 4–6 individuals; joins mixed feeding flocks. Forages in lower and middle levels of forest, vine tangles and thickets. Probes at bark and moss on trunks, branches and stems, and works up trunks; also gleans from foliage and twigs.

**Breeding.** No information; compounded by difficulties in identification.

#### Movements

**Status and Conservation.** Not globally threatened. Assessment of status complicated by difficulties in identification. Appears to be common in lowland, hill and lower montane forests over a wide area of New Guinea, much of its habitat lying in remote and inaccessible places. Taxonomy requires resolution, but no obvious immediate conservation concerns.

**Bibliography.** Bechler *et al.* (1986), Coates (1990), Diamond (1969, 1985), Gilliard & LeCroy (1970), Keast (1978c), Mayr (1937), Rand & Gilliard (1967).

## 13. Tropical Scrubwren

### *Sericornis beccarii*

French: Séricorne de Beccari German: Beccarisericornis Spanish: Sedosito de Beccari

Other common names: Beccari's Scrubwren/Sericornis, Little Scrubwren/Sericornis, Tropical Sericornis; Aru Scrubwren (*beccarii*)

**Taxonomy.** *Sericornis beccarii* Salvadori, 1874, Wokan, Aru Islands.

Part of a species group that also includes *S. nouhuysi*, *S. virgatus* and *S. magnirostra*. Sometimes treated as conspecific with *S. magnirostra*, and in NE Australia race *dubius* apparently intergrades extensively with latter in extreme S of range (Cooktown S to R Bloomfield, in N Queensland); generally, however, differs significantly from it in vocalizations and behaviour, and in plumage of most races. Often treated as conspecific with *S. virgatus*, and a number of as yet unnamed forms from Bomberai Peninsula (Fakfak Mts, Kumawa Mts) and from E New Guinea (Mt Bosavi/L. Kutubu) may belong with either species; in other areas, however, the two seem to behave as separate species, replacing each other altitudinally. Intergrades with *S. virgatus* known from Mt Bosavi, where specimen from 750 m typical of present species, while from 1520 m one specimen almost typical of *S. virgatus* and another intermediate between the two (most resembling present species); specimen from 1450 m on nearby Mt Sisa is also intermediate, but closer to *S. virgatus*. There may be both montane and lowland cryptic species involved. Genetic and vocal studies required in order to help in unravelling relationships in this complex of poorly known taxa. Eight subspecies currently recognized.

#### Subspecies and Distribution

*S. b. wondiwoi* Mayr, 1937 - Wandammen Peninsula (Wondiwoi Mts), in NW New Guinea.

*S. b. beccarii* Salvadori, 1874 - Aru Is.

*S. b. weylandi* Mayr, 1937 - W New Guinea (Weyland Mts).

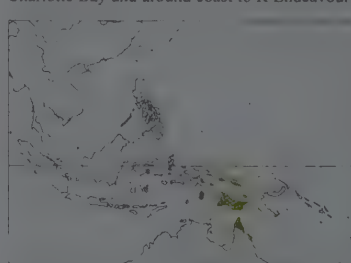
*S. b. idenburgi* Rand, 1941 - NW New Guinea (Gauttier Mts and slopes above R Idenburg).

*S. b. cyclops* E. J. O. Hartert, 1930 - Cyclops Mts, in N New Guinea.

*S. b. randi* Mayr, 1937 - S New Guinea (Trans-Fly lowlands).

*S. b. minimus* Gould, 1875 - N Queensland (Cape York Peninsula S to R Watson and R Pascoe-Lockhart River), in extreme NE Australia.

*S. b. dubius* Mayr, 1937 - E Cape York Peninsula, from R Pascoe-Lockhart River S to Princess Charlotte Bay and around coast to R Endeavour (Cooktown-Helenvale region).



**Descriptive notes.** 11–15 cm; 10–11 g. A medium-sized, long-legged scrubwren, most races with distinctive head pattern. Nominative race has dark olive upperparts, browner on crown, wing and tail; forehead and lores black, whitish supraloral spot, small white spot above eye and another below eye; median and greater upperwing-coverts black, tipped white (forming two short broken wingbars); throat whitish, breast and belly washed yellowish, breast indistinctly streaked olive, flanks olive; iris red-brown; bill dark brown or pale flesh-brown, sometimes paler base of lower mandible; legs fleshy brown to pale fleshy pink.

Sexes similar. Juvenile undescribed. Races differ mainly in plumage tones and markings. Australian forms with minor sexual dimorphism; *randi* is similar to nominate, but has greener upperparts, white upper throat spotted black, breast and belly yellow, breast streaked with grey, yellowish undertail-coverts, *cyclops* resembles previous, but has smaller supraloral and eye spots, ear-coverts tinged cinnamon, throat unspotted whitish, breast mottled grey; *weylandi* is similar to previous, but has larger white supraloral and eye spots, more black in lores; *wondiwoi* is also similar, but supraloral and eye spots small, lores and cheek cinnamon; *idenburgi* is darker than last, and wing-coverts have narrow greyish or whitish tips; *minimus* has breast quite heavily streaked dark (variable, some, perhaps from farther S, have only sparse fine streaks), prominent eye spots (form narrow broken white evening), sometimes a narrow whitish supercilium, also chin and throat may have fine dusky flecking, sexually dimorphic, male with contrasting black lores; female duller with more poorly marked face pattern; *dubius* differs from last in having pale facial markings much less distinct (dull creamy broken evening and supraloral spot, hint of pale supercilium); lores and ear-coverts rusty brown, wing markings much less distinct (although still obvious), warmer rusty buff below, merging into pale buffy white on chin and throat, creamy buff on belly, female duller facial markings and deeper tawny-buff underbody (fading to paler on belly), juvenile may be similar to adult perhaps with duller grey to pale brown iris. Voice. Variable. Song in W & N New Guinea a

short series of rapidly repeated high-pitched notes, reminiscent of Fairy (*Gerygone palpebrusa*) or Green-backed Gerygones (*Gerygone chloronota*); that of lower-montane races said to resemble that of *S. nouhuysi*, but with fewer and higher notes, more tinkling and less run together; also has harsh scolding rasp, similar to call of Black Monarch (*Monarcha axillaris*). In Australia, *dubius* has rather gerygone-like twittering “whitty chew whitty chew whitty chew” series, also scolding chatter typical of genus, and *minimus* a quite high-pitched reeling series, voice of both races quite distinct from that of *S. magnirostra*.

**Habitat.** Lowland races (nominate, *randi*, *minimus* and *dubius*) inhabit rainforest, riverine and monsoon forest, and vine thickets. Those at higher elevations (*wondiwai*, *weylandi*, *idenburgi*, *cyclopum*) occupy hill forest, lower montane forest and secondary growth from 600 m to c. 1520 m, sometimes to 1800 m in W New Guinea.

**Food and Feeding.** Food details not recorded but insectivorous, taking wide variety of arthropods. Usually seen in pairs or in small groups (presumed families) of 4–6 individuals; joins mixed feeding flocks in New Guinea. Forages in lower and middle levels of forest, vine tangles and thickets; probes at bark and moss on trunks, branches and stems and works up trunks and stems, but also gleans from foliage and twigs; behaviour like that of *S. nouhuysi*. In Australia, race *dubius* feeds low down and in middle stage, foraging actively in vine thickets, pandanus (*Pandanus*) and rattans (Calameae) and from leaves and branches, also from leaf litter on ground, acts more like *S. magnirostra* but seems more energetic and often more wary than latter; *minimus* forages on ground, and in vine tangles, pandanus and monsoon-forest thickets at low to middle levels, is altogether very different from *S. magnirostra*, usually much less confiding and more skulking, and seems behaviourally more like *S. frontalis*. In New Guinea, co-exists in places with *S. arfakianus* and *S. spilodera*, but segregated by foraging height and foraging substrate.

**Breeding.** Poorly known; essentially unknown in New Guinea. Following details apply to Australian populations. Breeds in Jul–Oct. Bulky, untidy domed nest with side entrance, constructed from fibres, tendrils and leaves, located in hanging roots or vines near ground, rarely above 1 m. Clutch 2–3 eggs, pale pinkish-brown, sparse brown speckles mainly around larger end; no information on incubation and nestling periods. Nests parasitized by Chestnut-breasted Cuckoo (*Cacomantis castaneiventris*) in far N Queensland.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Common in suitable forest over wide area of New Guinea, with much habitat in remote and inaccessible places. Australian races occupy restricted-range relict rainforest and vine thickets, much of which is within well-managed and properly functioning (as opposed to merely designated) national parks. No obvious immediate conservation concerns regarding any of the forms. Research required in order to resolve taxonomy of this group, which could have a bearing on conservation status of various taxa involved.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Boles (1979a), Christidis & Boles (1994), Christidis *et al.* (1988), Coates (1990), Diamond (1985), Friih, C.B. & Friih (1993b), Friih, D.W. & Friih (1995), Gilliard & LeCroy (1970), Gyldestolpe (1955b), Hartert *et al.* (1936), Higgins & Peter (2002), Keast (1978c), Mayr (1937), McCarthy (2006), McGill (1970), Morcombe (2003), Parker (1970b), Pizzey & Doyle (1986), Pizzey *et al.* (2005), Rand & Gilliard (1967), Schodde (1975), Schodde & Mason (1999), Serventy *et al.* (1982), Simpson *et al.* (2004), Slater *et al.* (2003), Strange (2001).

## 14. Large-billed Scrubwren

### *Sericornis magnirostra*

**French:** Séricorne à grand bec    **German:** Fahlstirnsericornis    **Spanish:** Sedosito Picudo

**Taxonomy.** *Acanthiza magnirostra* Gould, 1838, New South Wales, Australia.

Part of a species group that also includes *S. nouhuysi*, *S. virgatus* and *S. beccarii*. Sometimes treated as conspecific with last of those, and apparently intergrades extensively with it in NE Australia, but the two differ significantly in vocalizations and behaviour, and generally also in plumage. Species name sometimes erroneously emended to “*magnirostris*”, but original name is not a valid adjectival form, and is therefore invariable. Three subspecies recognized.

**Subspecies and Distribution.**

*S. m. viridior* Mathews, 1912 – NE Queensland (from Mt Amos–Big Tableland S to Paluma Range), in NE Australia.

*S. m. magnirostra* (Gould, 1838) – coastal and subcoastal Australia from E Queensland (Clarke Range) S, E of Great Dividing Range, to E Victoria (E Gippsland).

*S. m. howei* Mathews, 1912 – W Gippsland and Strzelecki Ranges, in S Victoria.

**Descriptive notes.** 10.5–12.5 cm; 10 g. A medium-sized rather featureless scrubwren with beady-looking dark eye in plain face, bill sometimes appearing slightly upturned. N nominate race is brownish-olive above, warmer on rump and uppertail-coverts: face buff-olive, bland-looking; uppertail



coloration: *howei* is a little darker above than nominate, with stronger yellow tinge below, possibly longer bill: *viridior* has longer wing but shorter tail than nominate, ear-coverts slightly darker, upperparts paler and browner (less olive), tail-coverts richer brown, chin and throat buff, underparts more strongly buff, belly usually tinged deeper yellow, flanks darker, undertail-coverts richer yellow-brown, variable some lower-altitude birds paler than those at higher elevation. Voice: Noisy, much more so than *S. kerri*, constantly twittering and giving contact calls as it forages. Typical call a scolding, penetrating “s-cheer s-cheer s-cheer” and various twittering notes, also sharp “sip” as contact. Mimics *S. frontalis*, *S. citreogularis* and *Gerygone moultoni*.

**Habitat.** Rainforest and wet sclerophyll forest in tropical, subtropical and temperate zones, frequenting forest margins, edges of clearings, treefalls, vine thickets, roadsides, gulleys and streamsides. Will occupy regrowth rainforest with exotic camphor laurel (*Cinnamomum camphora*), lantana (*Lantana*) and small-leaved privet (*Ligustrum sinense*). Away from wet tropics, occurs in wet sclerophyll with eucalypts such as tallow-wood (*Eucalyptus microcoryx*), blackbutt (*Eucalyptus pilularis*), red mahogany (*Eucalyptus resinifera*) and river peppermint (*Eucalyptus elata*); in Victoria most widespread in mountain ash (*Eucalyptus regnans*) forests, not in wet stringybark forests, and sometimes found in dry sclerophyll with low shrubby understorey. Sea-level to 1200 m in New South Wales; to at least 1000 m in Queensland, where replaced at higher elevations by *S. kerri*.

**Food and Feeding.** Insectivorous, but will take spiders (Araneae) and snails (Gastropoda), too. Recorded food items include beetles (of families Carabidae, Chrysomelidae, Colydiidae, Curculionidae), wasps (Hymenoptera), ants (Formicidae), and lepidopteran larvae. Forages in pairs or in small flocks of up to six individuals, probably often family parties. Active in wet tropics mostly in cooler parts of day, with resurgence in late afternoon if weather permits. Forages mostly at lower and middle levels of forest, at 1–17 m, occasionally on ground, and will ascend to lower canopy at times. Gleans arthropods from foliage and bark of woody stems, tree trunks, branches and vines, working up trunk in spiral fashion while constantly calling; often hangs upside-down. Associates readily with other species, e.g. fantails (*Rhipidura*), Spectacled Monarch (*Monarcha trivirgatus*), Pied Monarch (*Arses kaupi*), Pale-yellow Robin (*Tregellasia capito*). Little Shrike-thrush (*Colluricincla megarrhyncha*) and *Gerygone* species. Usually quite tame and inquisitive.

**Breeding.** Season Jun–Feb, mostly Nov–Dec; sometimes double-brooded. Nest domed or ovate, with slightly hooded side entrance, made of leaves, leaf parts, vines, stems, twigs, bark, rootlets and dry grass, interior of soft plant fibres and grass, lined at base with feathers, average external diameter 11.4 cm, height 19.1 cm, entrance diameter 2.5 cm; usually 0.5–6 m above ground, well concealed but can also be conspicuous, built in tree, vines, rattans, tree-ferns, palm fronds or other plants; newly completed or abandoned nest of other birds (particularly *S. citreogularis*, where present) often appropriated and feather lining usually added, although usually builds own nest in wet-tropics zone. Clutch 2–5 eggs, usually 3, brownish-white to pale purplish-brown with darker spots and blotches, these often forming cap around larger end; little information on incubation and nestling periods, nestling period at least 13 days at one nest, fledglings attended by both parents. Nests parasitized by Fan-tailed (*Cacomantis flabelliformis*) and Chestnut-breasted Cuckoos (*Cacomantis castaneiventris*), and also Horsfield’s (*Chrysococcyx hasalis*) and Shining Bronze-cuckoos (*Chrysococcyx lucidus*).

**Movements.** Mostly sedentary; some evidence of local wandering in winter.

**Status and Conservation.** Not globally threatened. Common through much of its large E Australian range. This species’ habitat is well represented in national parks and reserves.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Christidis & Boles (1994), Christidis *et al.* (1988), David & Gosse (2002a), Emison *et al.* (1987), Gosper (1992), Hall (1974a), Higgins & Peter (2002), Joseph *et al.* (1993, 1995), Keast (1978e), Kikkawa *et al.* (1965), Mayr (1937), McCarthy (2006), McGill (1970), Morcombe (2003), Moritz & Faith (1998), Nielsen (1991, 1996), North (1964), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Stresemann & Paludan (1932b), Wieneke (1992a).



inches 3  
cm 8

PLATE 46



## 15. Pale-billed Scrubwren

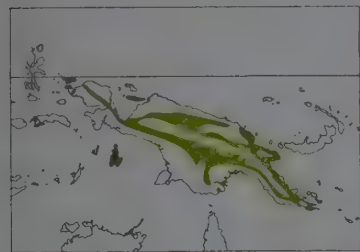
### *Sericornis spilodera*

**French:** Séricorne à bec blanc **German:** Fahlschnabelsericornis **Spanish:** Sedosito Piquiblanco  
**Other common names:** Pale-billed Sericornis

**Taxonomy.** *Entomophila? spilodera* G. R. Gray, 1859, Manokwari, north-western New Guinea. Seven subspecies recognized.

#### Subspecies and Distribution.

- S. s. ferrugineus* Stresemann & Paludan, 1932 – Waigeo I (N West Papuan Is).
- S. s. batantae* Mayr, 1986 – Batanta I (C West Papuan Is).
- S. s. spilodera* (G. R. Gray, 1859) – mainland NW & N New Guinea E to Astrolabe Bay, and Yapen I (in Geelvink Bay).
- S. s. aruensis* Ogilvie-Grant, 1911 – Aru Is.
- S. s. granti* (E. J. O. Hartert, 1930) – W New Guinea (Snow Mts).
- S. s. wuroi* Mayr, 1937 – S New Guinea (locally in Trans-Fly lowlands).
- S. s. guttatus* (Sharpe, 1882) – mountains of E New Guinea (E from Huon Peninsula and Aroa R).



**Descriptive notes.** 10–12.5 cm. A medium-sized scrubwren with distinctive pale bill, most races with blackish streaking on throat. Nominate race has crown blackish, upperparts olive, upperwing and tail brownish; throat white; chin and throat whitish, streaked blackish, underparts yellowish-white, breast obscurely streaked grey, flanks dingy pale olive; iris reddish-brown or brown; bill pale pinkish or horn-coloured; legs greyish-brown or light brownish. Sexes alike. Immature is similar to adult but has crown brownish, lacks dark streaks below. Races differ in minor features of plumage: *guttatus* is similar to nominate,

but has greenish crown; *wuroi* is similar to previous but paler and greener above, with yellowish-green flanks; *granti* has browner crown and ear-coverts, reduced throat spotting, flanks yellow; *ferrugineus* has rufous forehead, greyish-rufous ear-coverts, much-reduced grey spotting on throat and much paler yellowish-white underparts; *aruensis* has rufous-olive crown, paler and buffy forehead and ear-coverts, back bright greenish-olive, throat white without spots, abdomen yellowish. Voice. Varies geographically. In E New Guinea (C & W Papua New Guinea) a distinctive, somewhat mournful quiet “nee-naw” that sounds like distant police-car siren; at Nomad R (in Western Province) a trisyllabic wistful series, a longer rising note followed by a slurred descending note and an end note which may either rise or fall in pitch; in Adelbert Mts some “nee-naw” disyllabic series among trills and twittering sounds. Repeated buzzy nasal “ch ch” call.

**Habitat.** Mainly hill forest at 200–1200 m, also in lowland forest in Trans-Fly lowlands and N New Guinea, and locally to c. 1650 m. Replaced at higher elevations by *S. nouhuysi*, but overlaps with *S. arfakianus* at some sites; co-exists with similar-sized *S. beccarii* in W New Guinea and in S (near Oriomo R).

**Food and Feeding.** Poorly known. Largely insectivorous. Keeps quite low in understorey but will ascend to middle level; gleans actively from leaves, twigs and branches; often flicks tail. Sometimes found in mixed-species flocks, including those with *Gerygone chrysogaster*, Chestnut-bellied Fantail (*Rhipidura hyperythra*), Spot-winged (Monarcha guttula) and Frilled Monarchs (*Arseus scopthalmus*), Wallace’s Wren (*Sipodotus wallacii*) and Hooded Pitohui (*Pitohui dichrous*).

**Breeding.** Birds with enlarged gonads in Jul and Aug in E of range (Karimui), suggesting breeding in dry season there. No other information.

**Movements.** Sedentary. Individual retrapped two years later at site of ringing.

**Status and Conservation.** Not globally threatened. Widespread but rather uncommon; unobtrusive, presence often first revealed by its voice. Lives at rather low density. Some local loss of habitat to gardens, and perhaps through logging, is occurring, but most forest remains intact.

**Bibliography.** Beehler *et al.* (1986), Bell (1970b), Christidis *et al.* (1988), Coates (1990), Coates & Peckover (2001), Diamond (1972), Greenway (1966), Gregory (2004), Hartert *et al.* (1936), Keast (1978c), Mack & Igag (1998), Mayr (1937), Mayr & Rand (1937), Rand & Gilliard (1967), Stresemann & Paludan (1932a, 1932b).

## 16. Buff-faced Scrubwren

### *Sericornis perspicillatus*

**French:** Séricorne fardé **German:** Brillensericornis **Spanish:** Sedosito Caricanela  
**Other common names:** Buff-faced Sericornis; Black-and-green Scrubwren (“*S. nigroviridis*”)

**Taxonomy.** *Sericornis perspicillata* Salvadori, 1896, Moroka, south-eastern New Guinea.

Forms a species pair with closely related *S. rufescens*. Form described as *S. nigroviridis* (dark olive-green, with dull blackish-grey on head to breast and central belly, some grey tips on upper throat) based on a single specimen from near Wau (SE New Guinea), believed to be almost certainly a melanistic individual of present species. Monotypic.

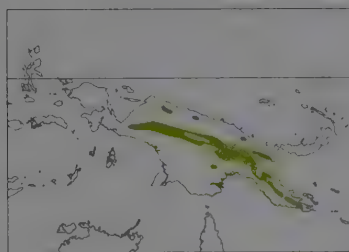
**Distribution.** Mountains of N, C, E & SE New Guinea: Gauttier Mts, Bewani Mts and Adelbert Mts, C ranges E from Weyland Mts, Mt Bosavi, also mountains in Huon Peninsula and SE ranges.

**Descriptive notes.** 10 cm. A small distinctive scrubwren with orange-buff face and eyering, dark eye standing out prominently. Facial area, chin and quite broad ring around eye are ochre-buff, contrasting with greyish-olive crown and forehead; upperparts, including upperwing and tail, olive, tail with dark subterminal band on all rectrices except central pair; underparts light ochraceous buff, darker on flanks and belly; iris blackish, brown or red-brown; bill dark brown or black, sometimes pale base of lower mandible; legs light brown or pale brownish-grey. Sexes alike. Juvenile is similar to adult.

**Voice.** Vocal. Song a repeated musical whistled “wee-sippee wee-sippee wee-sippee”, also an ascending “ju ju jee” series, or rising and then falling “jit-tita-weha-ta”. Harsh scolding “chut” as alarm.

**Habitat.** Humid montane and mid-montane forest, casuarina (*Casuarina*) groves, secondary growth and village gardens; 1500–2450 m, locally down to 850 m and up to 2800 m.

**Food and Feeding.** Insectivorous; adults seen to feed nestlings with arthropods, including moths and small caterpillars (Lepidoptera). Forages mainly in lower to middle levels, sometimes ascend-



and with slight porch or hood, constructed of moss, rootlets and bamboo leaves, lined with feathers, fine grass and rootlets, suspended from shrub or sapling by a clearing, in one case 0.75 m above ground. No information on eggs, nor on incubation and fledging periods; nestlings fed by both adults.

#### Movements.

**Status and Conservation.** Not globally threatened. Common species of montane forests over wide area of New Guinea. Often located by means of its calls. Much of this species’ habitat lies in remote and inaccessible places, and is therefore relatively secure in the short term, at least.

**Bibliography.** Beehler (1978a), Beehler *et al.* (1986), Christidis *et al.* (1988), Coates (1990), Coates & Peckover (2001), Gilliard & LeCroy (1961a), Gyldenstolpe (1955a), Hartert *et al.* (1936), Junge (1953), Keast (1978c), Mayr (1931b), Mayr & Rand (1937), Rand & Gilliard (1967), Salvadori (1896), Sims (1956).

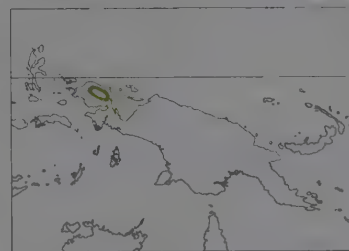
## 17. Vogelkop Scrubwren

### *Sericornis rufescens*

**French:** Séricorne chamois **German:** Braunhrsericornis **Spanish:** Sedosito de Vogelkop  
**Other common names:** Arfak/Rufous Scrubwren, Arfak Buff-faced Scrubwren, Arfak Buff-faced Sericornis, Rufous Sericornis

**Taxonomy.** *Gerygone? rufescens* Salvadori, 1876, Hatam, Arfak Mountains, Vogelkop, New Guinea. Forms a species pair with *S. perspicillatus*, which it replaces in the Vogelkop. Monotypic.

**Distribution.** Vogelkop (Tamarau Mts, Arfak Mts) and Bomberai Peninsula (Kumawa Mts), in NW New Guinea.



**Descriptive notes.** 10 cm. A small mid-montane scrubwren. Plumage is olive-brown above, tinged buffy on forehead, and with prominent buffy eyering; tail brown with blackish subterminal band; pale creamy below, belly whitish; iris dark brown; bill blackish, sometimes pale base of lower mandible; legs whitish-brown. Differs from *S. nouhuysi* and *S. virgatus* mainly in smaller size, dark tailband, distinctive pale eyering, lack of rusty colour on face and throat. Sexes alike. Juvenile undescribed. Voice. Song lively, consists of groups of 2 or 3 notes, each group repeated a few times before next one starts; not unlike

song of *S. papuensis*, but weaker. Call a dry “chip”; nasal “chee chee” from flocks.

**Habitat.** Mid-montane forest, secondary growth and village gardens, at 1300–1800 m.

**Food and Feeding.** Insectivorous. Occurs in small vocal groups, foraging in foliage from low levels to middle stratum; joins mixed-species flocks. Behaviour similar to that of *S. perspicillatus*.

**Breeding.** No information.

#### Movements.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Papuan Highlands EBA. Common in mid-montane forests in Vogelkop. Much of the habitat in this region is in remote and inaccessible places and in nominally designated reserves there.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), Gilliard & LeCroy (1970), Gyldenstolpe (1955b), Hartert *et al.* (1936), Keast (1978c), Mayr (1937), Rand & Gilliard (1967), Strange (2001).

## 18. Papuan Scrubwren

### *Sericornis papuensis*

**French:** Séricorne papou **German:** Papuasericornis **Spanish:** Sedosito Papú  
**Other common names:** Olive Scrubwren, Papuan Sericornis

**Taxonomy.** *Acanthiza papuensis* De Vis, 1894, Mount Maneao, south-eastern New Guinea. Three subspecies recognized.

#### Subspecies and Distribution.

- S. p. burgersi* Stresemann, 1921 – C cordillera of New Guinea from Weyland Mts E to Sepik Mts and Central Highlands.
- S. p. meeki* Rothschild & E. J. O. Hartert, 1913 – Jayawijaya Mts, in WC New Guinea.
- S. p. papuensis* (De Vis, 1894) – Eastern Highlands and mountains of SE New Guinea.

**Descriptive notes.** 10–11.5 cm. A medium-sized scrubwren of high-elevation montane forest. Nominate race has forehead variably ochraceous-buff, crown and upperparts olive-brown to olive-green, upperwing browner, tail chestnut-brown to olive-green with indistinct dark brown subterminal bar; facial area and paler narrow eyering ochraceous buff, merging into paler and buffier ochraceous throat and upper breast; rest of underparts variably pale buffy, buffy white or yellowish-white, merging into olive on flanks; iris dark brown to golden-brown; bill brown to black; legs greyish-brown to tan. Differs from *S. nouhuysi* mainly in somewhat smaller size, lack of rusty colour on face and throat. Sexes alike. Juvenile is olive-green to dark green above, with pale forehead, sometimes dark-tipped crown feathers (giving scaled effect), tail browner, eyering yellowish to buffy, underparts olive-yellow, sometimes with faint darker streaking. Race *burgersi* is browner





above, more brownish-ochraceous below; throat very green above (as some nominate), more distinct rufous wash on throat and underparts, nominally darker olive. Voice. Twitter, somewhat flat chatter, "tootee tooteetootee", seems to be both the song and the contact call during foraging; often given at quite long intervals of 30 or more seconds. Also dry "chip" notes, similar to those of congeners.

**Habitat.** Upper montane forest and secondary growth, especially low dense bushy trees alongside tracks, mainly at 2000–3500 m; sometimes as low as 1500 m, rarely down to 850 m. Overlaps mainly with *S. nouhuysii*, and

at lower limits also sometimes with *S. perspicillatus*.

**Food and Feeding.** Insectivorous. Usually seen singly or in small parties of up to four individuals. Forages from low down to middle storey, occasionally higher; gleans from branches, twigs and leaves, and often well concealed inside dense bushy growth.

**Breeding.** May breed mainly in less wet Jul–Oct season, but recorded once in Apr. Nest a teardrop-shaped structure with side entrance and small porch or hood, covered externally with green moss, some of this dangling below as mossy "tail", lined with dried leaves of scrambling bamboo and feathers; 1.5–1.75 m above ground, suspended from e.g. scrambling bamboo and sheltered by overhanging vegetation. All nests found so far contained only 1 egg, dirty pale fawn, slightly darker at larger end, with sparse fine purple-brown spots all over and fine dark brown squiggles and lines mostly at larger end. No other information.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Common in montane forests over wide area of New Guinea, where chattering call a characteristic sound at dawn and in late afternoon at high altitude. Much of this species' habitat lies in remote and inaccessible places.

**Bibliography.** Beehler *et al.* (1986), Christidis *et al.* (1988), Coates (1990), Diamond (1972), Frith & Frith (1988, 1993b), Gilliard & LeCroy (1961a), Gyldestolpe (1955a), Keast (1978c), Mayr (1937), Mayr & Rand (1937), Rand & Gilliard (1967), Strang (2001), Stresemann (1921).

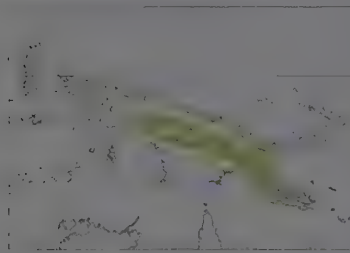
## 19. Grey-green Scrubwren

### *Sericornis arfakianus*

French: Séricorne vert-de-gris German: Arfaksericornis Spanish: Sedosito de las Arfak  
Other common names: Dusky/Olive Scrubwren, Grey-green Sericornis

**Taxonomy.** *Gerygone arfakiana* Salvadori, 1876, Arfak Mountains, Vogelkop, New Guinea. Monotypic.

**Distribution.** Vogelkop and C cordillera of New Guinea, also mountains in N from Cyclops Mts E to Adelbert Mts and Huon Peninsula.



**Descriptive notes.** 9–10 cm. A small, nondescript scrubwren. Plumage is dark olive-green above, tail slightly browner and with dark sub-terminal bar on all rectrices except central pair; below, indistinctly streaked darker olive on mainly olive background, with greyish wash on throat and yellowish centre of belly, sometimes indication of drab diffuse breastband; iris brown; bill brownish-black; legs light grey-brown. Sexes alike. Juvenile is similar to adult, but rather more brownish above and darker below. Voice. Poorly known. Short, dry "chip", sometimes in series, and singly as preface to musical whistled, "whee choo whee choo whee choo" song, given every few seconds; also described is a high-pitched sweet song, beginning with feeble notes and ending as louder short fast trill. Dry scolding calls typical of genus also given, "tsee tsee tsee tsee tsee tsee".

**Habitat.** Lower montane forest and adjacent tall secondary growth, sometimes extending to remnant patches by native gardens; mainly c. 1200–1400 m, locally from 670 m and up to 1700 m. Occupies a rather narrow altitudinal band, which may be as little as 180 m. Overlaps with *S. spilodora* at lower elevations and with *S. perspicillatus* and *S. nouhuysii* at the higher levels in E.

**Food and Feeding.** Poorly known; likely to be largely insectivorous. Usually seen singly, or in presumed pairs or small family groups of up to four individuals. Forages in lower to middle levels, to c. 8 m. Gleans actively from foliage, branches and twigs.

**Breeding.** Juvenile in early Oct in E. of range. No other information available.

#### Movements. Resident.

**Status and Conservation.** Not globally threatened. Generally uncommon and local species occupying a relatively narrow altitudinal band of the lower montane forest. Not well known.

**Bibliography.** Beehler *et al.* (1986), Christidis *et al.* (1988), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961a, 1970), Gyldestolpe (1955b), Hartert *et al.* (1936), Keast (1978c), Mayr (1931b, 1937), Mayr & Rand (1937), Rand & Gilliard (1967), Salvadori (1896).

## Genus ACANTHORNIS Legge, 1887

### 20. Scrubtit

#### *Acanthornis magna*

French: Séricorne de Tasmanie German: Stammhüscher Spanish: Sedosito Tasmano

**Taxonomy.** *Acanthornis magna* Gould, 1845, Western Tiers, near Deloraine, Tasmania.

**Habitat.** Montane forest, mainly c. 1000–1500 m. Recently described race *A. magna* is poorly known, only four specimens. Genus originally combined with feminine adjective, and is thus deemed to be feminine. Two subspecies recognized.

#### Subspecies and Distribution.

*A. m. greeniana* Schodde & Mason, 1999 – King I, in W Bass Strait (off SE Australia).

*A. m. magna* (Gould, 1855) – Tasmania.



**Descriptive notes.** 11–12 cm; 10 g. Small scrubwren-like species with distinctive head pattern, strikingly pale eye and short, slightly decurved bill. Nominative race has olive-brown forehead and crown merging into greyer brown hindneck and side of neck, broad diffuse greyish-white supercilium in front of eye, tapering behind eye above ear-coverts, narrow partial white eyering (around rear and bottom of eye), greyish lower lores and ear-coverts forming obvious mask that merges into brownish neck side; brownish-olive mantle, merging into more red-brown rump and uppertail-coverts; uppertail dark brownish-grey, rectrices edged

reddish-brown, with prominent broad black subterminal band, outer two or three feather pairs narrowly tipped white; upperwing brownish-grey, remiges edged grey, tips of outer greater coverts white (forming prominent large white spot near shoulder), outer median coverts also with small white tips (often obscured by scapulars), narrow white tips on middle and longest tertials, fine pale fringing on inner secondaries; chin and throat white; underparts mainly white, washed pale yellow, breast side, flanks, vent and undertail-coverts light brownish; iris orange-yellow to yellow-brown; bill greyish-black, grading to paler at base of lower mandible; legs grey to pinkish-brown. Differs from *Sericornis humilis* mainly in striking face pattern and dark tailband. Sexes alike. Juvenile is similar to adult but duller, paler yellow on underparts, white shoulder spots less well defined. Race *greeniana* is similar to nominate but may be smaller, with longer bill, and slightly paler, with narrower subterminal tailband. Voice. Sweet musical song phrase, sometimes prefaced by very quiet zitting notes, "to wee to tsee tee tee tee" series. Soft "peep" or "cheep" as contact; may give rapid high-pitched zitting twitter when foraging, but often rather silent.

**Habitat.** Cool-temperate rainforest and moist eucalypt (*Eucalyptus*) forest with dense understorey of shrubs and ferns, particularly in gulleys. Inhabits forest dominated by antarctic beech (*Nothofagus cunninghamii*) and with rich understorey of moss and ferns, especially soft tree-fern (*Dicksonia antarctica*), or with rich shrub layer including musk daisy-bush (*Olearia argophylla*), horizontal tree (*Anodopetalum biglandulosum*) or cutting grass (*Gahnia grandis*); also subalpine eucalypt forest dominated by snow gum (*Eucalyptus coccifera*), yellow gum (*Eucalyptus johnstonii*), urn gum (*Eucalyptus urnigera*), cider gum (*Eucalyptus gunnii*) or varnished gum (*Eucalyptus vernicosa*), with dense and varied shrub layer. At higher elevations, found also in low dense shrubs on moorland and in dwarf conifer forest or shrubland dominated by pencil pine (*Athrotaxis cupressoides*) and *Athrotaxis laxifolia* and shrubs up to 1 m tall. On King I (race *greeniana*), inhabits damp fern gulleys in remnant wet sclerophyll forest and gulleys with tall swamp paperbark (*Melaleuca ericifolia*).

**Food and Feeding.** Food invertebrates, mostly insects, including cockroach eggs (Blattodea), beetles (Coleoptera, including curculionids), bugs (Hemiptera), flies (Diptera), lepidopterans, also small snails (Gastropoda) and spiders (Araneae). Forages mostly singly or in pairs, sometimes in small family groups of up to four individuals; unobtrusive and at times shy. Forages on ground and in lower levels, occasionally ascending to canopy. Probes particularly at trunks, branches, bark and crevices, also at leaves, tree-ferns, moss, fallen tree trunks, logs and leaf litter. Explores trunks and branches methodically, by working up and down in manner similar to that of *Sericornis magnirostris*, clinging sideways; flies to base of tree-ferns to work its way up trunk, before repeating the process. Will associate with mixed feeding flocks, including those with *Sericornis humilis*, *Acanthiza ewingii* and Golden Whistler (*Pachycephala pectoralis*).

**Breeding.** Season Sept–Jan. Breeds as monogamous pair. Maintains territory at least when breeding, and likely to be found nearby all year. Nest globular and bulky, with hooded side entrance, often made of tree-fern hairs but also bark strips, green moss, rootlets, fern fronds, grass, twigs, leaves, feathers and lichen, inner structure often of tree-fern hairs and fibre overlaid by fern fronds, bark strips and bark fibres, lined with small feathers from honeyeaters (Meliphagidae), *Sericornis* and pachycephalids, also fur, one nest had external diameter 20.3 cm, height 19.1 cm, entrance diameter 3.8 cm; placed usually 0.9–3 m above ground, occasionally lower (down to 8 cm) or higher (to 4 m), and well camouflaged, usually in dense cover, frequently deep drooping fronds of tree-ferns, also in low shrub, native currant (*Coprosma quadrifolia*) or exotic brambles (*Rubus fruticosus*). Clutch usually 3 eggs, sometimes 4, pearly white, often speckled with reddish or purplish-brown, forming zone at large end; known to re-lay if clutch lost; no information on incubation and nestling periods; young fledglings huddle together, fed by both adults, disperse in late summer and autumn. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Few data on success: many nests destroyed by adverse weather and falling branches; nest contents taken by quolls (*Dasyurus*).

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Tasmania EBA. Unobtrusive and easily overlooked. Patchy distribution in Tasmania, and absent from much of E & C parts, where forest clearance has been extensive; effects of large-scale timber plantations and consequent weed-spraying unknown, but will undoubtedly reduce insect populations and floristic diversity, with consequent reduction in native species. Recently described King I race *greeniana* is "Critically Endangered", reduced to remnant populations in gulleys in vestigial woodland following large-scale forest clearance, and current population estimated at fewer than 200 adults, reported as having disappeared from Pegarah Forestry Reserve, the largest area of suitable forest remaining. **Bibliography.** Anon. (2007a, 2007b), Ashby (1917), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Butler (1906), Campbell (1935), Christidis & Boles (1994), David & Gosselin (2002b), Garnett & Crowley (2000), Green (1989, 1995), Higgins & Peter (2002), McGill (1970), Morcombe (2003), North (1904), Pickett (1996), Pizzey *et al.* (2005), Ratkowsky & Ratkowsky (1980), Schodde & Mason (1999), Sharland (1925, 1954), Slater *et al.* (2003), Thomas (1974), Watts (2002).

## Genus HYLACOLA Gould, 1843

### 21. Chestnut-rumped Heathwren

#### *Hylacola pyrrhopygia*

French: Séricorne à croupion roux German: Heidehüscher Spanish: Sedosito Culirrojo



**Other common names:** Chestnut-rumped Groundwren/Hylacola, Chestnut-tailed Heathwren/ Groundwren/Hylacola, Geelong Groundwren, Eastern Hylacola, Charleville Scrubwren, Red-rumped Scrub-warbler

**Taxonomy.** *Acanthiza pyrrhopygia* Vigors and Horsfield, 1827. Sydney region, New South Wales, Australia.

Often placed in genus *Calamanthus*. Forms a species pair with *H. cauta*. Three subspecies recognized. **Subspecies and Distribution.**

*H. p. pyrrhopygia* (Vigors & Horsfield, 1827) – coastal SE Australia S from granite belt of SE Queensland, inland to W slopes of Great Dividing Range, and extreme SE South Australia and much of Victoria.

*H. p. pederi* (Schodde & Mason, 1999) – S Flinders Range, in South Australia.

*H. p. parkeri* (Schodde & Mason, 1999) – Mt Lofty Ranges, in South Australia.

**Descriptive notes.** 12.5–16 cm; 17 g. A terrestrial acanthizid with long tail held cocked. Male nominate race is rather dark warm brown above, greyer on crown and neck side, with short off-white narrow supercilium ending shortish behind eye, rich chestnut uppertail-coverts; tail with blackish subterminal band and greyish tip on all except central pair of rectrices; inconspicuous small whitish patch at base of outer primaries (often much less apparent than that of *H. cauta*), tips of median and greater upperwing-coverts white (forming narrow white wingbars); mainly white below, washed light grey-brown on flanks and thighs,



with dense narrow dark grey-brown streaking on chin, throat and breast, more diffuse streaks on flanks, chestnut-brown undertail coverts; iris red-brown, brownish-yellow or cream; bill blackish-brown or grey-black above, pale cutting edges, lower mandible pinkish-brown, sometimes with darker tip, gape pale grey to pale pinkish-brown; legs pink or pinkish-brown. Female differs from male in having buff supercilium and underparts, finer streaking below, off-white centre of belly and vent. Juvenile is distinctive, with less distinct facial pattern, wingbars buffy, unstreaked underparts washed pale buff, grading to cream on belly and vent, mottled grey on some, gape yellow, iris darker greyish-brown. Races differ in plumage tone: *parkeri* is not so dark as nominate; *pederi* is palest. **VOICE.** Song, given from prominent perch in or on bush, mostly in breeding season, by both sexes (male more vocal), a rich and melodious sweet warbling series with mimicry interspersed, individually variable, can seem ventriloquial; individuals known to mimic up to ten or more species (sometimes including songs, calls and alarm notes), and total of 37 reported by those near Sydney, including Eastern Whipbird (*Psophodes olivaceus*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Yellow-tailed Black-cockatoo (*Calyptrorhynchus funereus*), Rufous Whistler (*Pachycephala rufiventris*) and Red-browed Finch (*Neochmia temporalis*). Duetting recorded. “Whisper song” given while hopping on ground. Contact call “zeet”; warning call to alert fledglings “zweet zweet”.

**Habitat.** Dense heathland, also low, thick understorey, particularly heathy formations, in dry sclerophyll forest and woodland. Likes ridges and slopes in rocky sandstone or granite country, heaths, well-vegetated creek and gully lines, and areas with many fallen branches. Heaths include *Banksia*, *Grevillea* and *Hakea* formations, casuarinas (*Casuarina*) and grass-trees (*Xanthorrhoea*), sometimes with a few scattered or small trees such as eucalypts (*Eucalyptus*). Found also in saltmarsh shrubland with glasswort (*Sarcocornia*), and in thick coastal scrub with grass tussocks and saltbush (*Atriplex*). Unlike *H. cauta*, generally avoids mallee. Lowlands, from coast to inland slopes of S Great Divide; avoids higher altitudes and tablelands, but recorded to 1200 m.

**Food and Feeding.** Diet consists of arthropods, including flies (Diptera), moths and larvae (Lepidoptera), cicadas (Cicadidae), cockroach egg sacs (Blattodea), ants (Formicidae), bugs (Hemiptera), and spiders (Araneae); also seeds, including those of families Cyperaceae, Poaceae and Polygonaceae. Forages singly or in pairs and in small family parties. Feeds beneath low vegetation on ground, or low in shrubs and trees. Will join mixed flocks with *Acanthiza* species, Splendid Fairy-wren (*Malurus splendens*) and Variegated Fairy-wren (*Malurus lamberti*). Often wary, but can be quite confiding.

**Breeding.** Season Jun–Dec; often double-brooded. Breeds as simple pair. Nest a compact dome, with side entrance at ground level, constructed from grass, bark, leaves, rootlets and twigs, lined with feathers, fur, fine grass and plant fibre; on or close to ground, well hidden beneath dense vegetation or beneath bark or fallen branches, and usually with clear view of approaches. Clutch 2–3 eggs, pinkish-buff, with chocolate-brown freckles concentrated in band at large end; incubation by female only, c. 14–16 days; chicks fed by both parents, which very responsive to squeaking calls of young (adults known to run over shoes of human observer in response to squeaks), may try to lure intruder from nest; nestling period c. 18 days; fledglings follow parents for up to 6–8 weeks. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Mainly resident, but some local wandering suggested; can turn up as vagrant outside normal range, e.g. in Australian Capital Territory (ACT). In the past, birds near Sydney said to leave heaths in Aug–Sept and move to dense taller scrub or rocky country, but confirmation required.

**Status and Conservation.** Not globally threatened. Fairly common in suitable habitat over much of range; less numerous in South Australia. Nominative race has good populations in national parks around Sydney, but still susceptible to fire and perhaps drought; urbanization has displaced species in some parts of range, as around Sydney. In South Australia, fragmentation of habitat a problem in Mt Lofty Ranges and Flinders Range, with consequent degradation of habitat, increased predation and fire risk; fewer than 2500 adults of race *parkeri* remain, including one population of c. 500 mature adults, and in 2005 this race was added to Australian list of threatened taxa, in category of “Endangered”, because of loss and deterioration of its wooded habitat. Flinders Range race *pederi* now listed as “Vulnerable”.

**Bibliography.** Anon. (2003a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Chisholm *et al.* (1988), Chisnolm *et al.* (1988), Croxall & Boies (1994), Day & Croxall (2002b), Eddy (1959), Garnett & Crowley (2000), Hall (1974a), Haywood (2006), Higgins & Peter (2002), Morcombe (2003), North (1904), Olsen *et al.* (2003), Parker (1984a), Pizzey *et al.* (2001), Ryan (1979, 1985), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003).

## 22. Shy Heathwren

### *Hylacola cauta*

French: Sérissime timide

German: Sandhüscher

Spanish: Sedosito Timido

**Other common names:** Shy Hylacola, Cautious Heathwren/Groundwren/Hylacola, Mallee Wren/ Groundwren/Heathwren/Hylacola, Red-rumped Groundwren/Heathwren/Hylacola, Rufous-rumped Groundwren/Heathwren/Hylacola, Shy Groundwren/Scrub-warbler; Western Groundwren/ Heathwren/Hylacola (*whitlocki*)

**Taxonomy.** *Hylacola cauta* Gould, 1843, western belt of Murray River between Palmer and Caloote, South Australia.

Often placed in genus *Calamanthus*. Forms a species pair with *H. pyrrhopygia*. Four subspecies recognized.

**Subspecies and Distribution.**

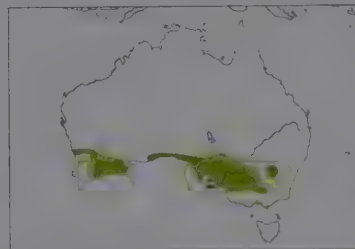
*H. c. whitlocki* Mathews, 1912 – S wheatbelt of SW Western Australia.

*H. c. cauta* Gould, 1843 – S South Australia (S from N Flinders Ranges) E to Victoria (Murray-Mallee).

*H. c. halmaturina* Mathews, 1912 – Kangaroo I, off South Australia.

*H. c. macrorhyncha* (Schodde & Mason, 1999) – mallee regions of C & SW New South Wales.

**Descriptive notes.** 11.5–14 cm; 15 g. A terrestrial species with prominent white supercilium extending well behind eye, long tail held cocked; rufous base of tail and white in wing obvious in flight. Male nominate race is dark brownish-grey above, reddish-brown wash on rump extending up back, rich chestnut uppertail-coverts; tail blackish, central pair of rectrices tipped ash-grey, remainder with prominent white tip, white patch at base of primaries (usually much more apparent than that of *H. pyrrhopygia*), white tips of median and greater wing-coverts (forming narrow indistinct wingbars); white below, grey-brown



wash on flanks and thighs, dense narrow black streaks from chin and throat to breast and, more diffusely, on belly side and flanks, undertail-coverts conspicuously rich chestnut; iris dark red-brown or yellow-brown; upper mandible blackish with pinkish-brown cutting edges, base of lower mandible pinkish-brown; legs dark grey to grey-brown. Female is similar to male but duller below, centre of belly whitish, and more finely streaked. Juvenile is distinctive, has duller supercilium, unstreaked light brown chin, throat and chest, flanks washed light brown. Race *whitlocki* is very similar to nominate, but perhaps broader white tips on outer secondary coverts; *macrorhyncha* has darker upperparts than nominate, breast darker and very heavily streaked dark brown, undertail-coverts darker rufous-brown, female more like nominate male above and more heavily streaked than nominate female below; *halmaturina* is most distinctive, with colder dark back, reduced white in wing, and disproportionately short tail. **VOICE.** Song a sweet melodious warbling, “chee-chee-chick-a-dee”, repeated; degree of mimicry uncertain. Delightful, very sweet “Whisper song” given from ground, audible to only c. 1 m. Calls include sharp scolding alarm, loud sharp “tchak”, also chattering and hissing notes.

**Habitat.** Prefers dense shrubby or heath understorey in mallee woodland, mallee shrubland or mallee heath in coastal and semi-arid regions, often where spinifex (*Triodia*) occurs and with dense shrubs such as *Banksia*, *Hakea* and *Grevillea*, also tea-tree (*Leprospermum*) and cypress pine (*Callitris*). Found also in some non-mallee formations, such as coastal acacia (*Acacia*) and saltbush (*Atriplex*) and bluebush (*Maireana*) shrublands, and will colonize regenerating mallee stands 1–2 m tall after fires or clearance.

**Food and Feeding.** Insects, also spiders (Araneae) and seeds. Insects recorded in diet include beetles (Coleoptera), flies (Diptera), bugs (Hemiptera), lepidopterans (Psyllidae), wasps (Hymenoptera), orthopterans, orthopterans and ants (Formicidae); seeds taken include those of asters (Asteraceae) and chenopods. Forages singly or in pairs or small family groups; will join mixed feeding flocks with *Acanthiza pusilla* and *Calamanthus campestris*. Forages on or close to ground beneath dense vegetation; may emerge on to cleared ground, where it hops about, running rapidly like a mouse (Muridae) when alarmed.

**Breeding.** Season Jul–Dec; often double-brooded. Likely to maintain territory in breeding season. Nest a compact dome, with side entrance at ground level (but much variation in size and structure, and may look like a pile of debris), constructed from grass, bark, leaves, rootlets and twigs, lined with feathers, fur, fine grass and plant fibre; placed on or close to ground, well hidden beneath dense vegetation or beneath bark or fallen branch. Clutch 2–4 eggs, usually 3, chocolate-coloured or pale purplish-pink with tiny brown freckles, reportedly similar to those of *Pyrrholaemus brunneus*; no information on incubation period; chicks brooded by female alone, fed by both sexes, nestling period poorly known, more than 10 days; adults perform injury-feigning distraction displays near nest; fledglings follow parents for up to 8 weeks. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Black-eared Cuckoo (*Chrysococcyx osculans*) and Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Resident, may make local movements in response to severe drought, but little information.

**Status and Conservation.** Not globally threatened. Fairly common to uncommon; and generally local. Has declined or disappeared in many areas where mallee has been cleared or fragmented; now considered “Near-threatened” in Riverina Region of New South Wales, and also in S Western Australia, where much habitat has been cleared for wheatfields. Fire may be a problem, as are habitat degradation, invasion by non-native plant species, and increased predation by cats and foxes (*Vulpes*) in areas where habitat fragmented. Occurs in Murray-Sunset National Park.

*Hylacola cauta*

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Chisholm & Boies (1994), Day & Croxall (2002b), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Morcombe (2003), North (1904), Pizzey *et al.* (2001), Ryan (1985), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003).

## Genus CALAMANTHUS Gould, 1838

### 23. Striated Fieldwren

#### *Calamanthus fuliginosus*

French: Sérissime strié

German: Strichelfeldhüscher

Spanish: Sedosito Estriado

**Other common names:** Field Wren, Eastern/Rock/Streaked Fieldwren, White-lored Fieldwren, Striated Calamanthus, (Striated) Reed-lark



**Taxonomy.** *Anthus fuliginosus* Vigors and Horsfield, 1827, Derwent River district, south-east Tasmania, Australia.

Forms a superspecies with *C. campestris* and *C. montanellus*. All three have often been treated as conspecific; further study required in order fully to resolve relationships within the genus. Four subspecies recognized.

**Subspecies and Distribution.**

*C. f. bourneorum* Schodde & Mason, 1999 – SE South Australia and SW Victoria (W Bassian Plain).

*C. f. albiloris* North, 1902 – coastal SE New South Wales (Illawarra region) S to C Bassian Plain of Victoria.

*C. f. diemenensis* North, 1904 – W Tasmania.

*C. f. fuliginosus* (Vigors & Horsfield, 1827) – E Tasmania.



**Descriptive notes.** 12.5–14 cm; 20 g. A small, heavily streaked acanthizid with short, stout bill, and long, slightly graduated tail usually held cocked. Male nominate race has forehead tan-coloured, merging into olive on top of head and neck, with coarse dark streaks; lores off-white, occasionally tinged brown, brownish facial patch, prominent off-white supercilium, thin whitish arc around bottom of eye; upperparts olive, moderately streaked dark, uppertail-coverts moderately streaked yellowish-brown and black; tail brownish-olive, thin black subterminal band and narrow dull grey tip; secondary upwing-coverts tipped whitish.

ish (forming narrow wingbar in fresh plumage), flight-feathers with pale fringes (forming pale wingpanel), whitish tips of tertials; variably pale buff to pale yellowish below, slightly paler on lower belly and vent, and with coarse narrow black streaks except on centre of belly; iris dark reddish-brown, sometimes off-white or pale yellow; bill grey-black, pinkish-brown base of lower mandible; legs dirty pink. Female differs slightly from male in having supercilium strongly suffused yellowish-brown and merging to pale buff, chin and throat pale buff (may be paler than underparts), black streaks below finer, especially on chin and throat. Juvenile is similar to adult, but streaking of underparts more diffuse. Races differ minimally in plumage and size, nominate having longer bill and legs than others; *bourneorum* is slightly smaller than nominate, with fine black streaking on upperparts, tail tip whitish-grey to white; *albiloris* is similar to previous but more heavily streaked black on upperparts, more finely on underparts, shorter bill and legs, minor colour differences; *diemenensis* is heavily streaked black above and below, lacks lemon-yellow cast on underparts, tail tip dull grey. Voice. Cheerful, loud, whistled musical rattle phrase, "whit whit chee whit pee chew" and variants, repeated persistently from atop shrub or low bush, less obvious outside breeding season. Sharp twittering and a "tang" note similar to that of White-fronted Chat (*Epithiamura albigularis*) also reported.

**Habitat.** Low dense vegetation, including heath, shrublands, tussock grass, saltmarsh, samphire and sedges, often near wetlands, coastal lagoons, streams and swamps, also in clearings in softwood plantations. In Tasmania occurs also in both dry and wet eucalypt (*Eucalyptus*) forest, occasionally in subalpine forest. Sea-level to c. 1000 m on mainland; higher in Tasmania, where recorded to snow-line.

**Food and Feeding.** Mainly arthropods, also seeds. Arthropods taken include beetles (of families Carabidae, Chrysomelidae, Curculionidae, Dytiscidae, Elateridae, Staphylinidae, Tenebrionidae), lygaeid bugs (Hemiptera), ichneumonids (Ichneumonidae) and lepidopterans; gastropods of genus *Bithymia* also noted; bread also taken. Seen singly or in pairs or family groups. Forages on ground and among low shrubs and vegetation.

**Breeding.** Season May–Mar; may have up to three broods in favourable year. Nests as simple pair, which may occupy territory of several hectares throughout year. Compact, roughly spherical nest, with side entrance near top, made of coarse grass, sometimes with leaves, seaweed, moss and rootlets, lined with fine grass, fur and feathers, placed on ground, well hidden under grass tussock or dense bush. Clutch 3–4 eggs, usually 3, light brown to purplish-brown or reddish-brown, indistinctly marked with darker spots and blotches on larger end; incubation seemingly by female, no information on duration of incubation and nestling periods; sits very tight on nest, reluctant to fly. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Pallid Cuckoo (*Cuculus pallidus*), Black-eared Cuckoo (*Chrysococcyx osculans*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Nest contents preyed on by blue-tongued lizard (*Tiliqua scincoides*), probably also by snakes; nests can be vulnerable to flooding and trampling by stock.

**Movements.** Resident; some local wandering in New South Wales, with records from near Sydney, 160 km NE of nearest known populations.

**Status and Conservation.** Not globally threatened. Considered to be generally uncommon; listed as "Vulnerable" in New South Wales. Has suffered habitat loss through land clearance and degradation, survives in roadside strips and remnants. Recorded in a number of national parks and reserves.

**Bibliography.** Anon. (1999b, 2007a, 2007c, 2007d), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Chisholm (1946), Christidis & Boles (1994), Emission *et al.* (1987), Garnett & Crowley (2000), Gosper & Baker (1997), Green (1989, 1995), Hall (1974a), Higgins & Peter (2002), Keast (1978b), Keast *et al.* (1985), McCarthy (2006), McGill (1970), Morcombe (2003), Parker & Eckert (1983), Pizzey *et al.* (2005), Ratkowsky & Ratkowsky (1977, 1980), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Sutton (1927), Taylor *et al.* (1997), Watts (2002).

## 24. Rufous Fieldwren

### *Calamanthus campestris*

**French:** Séricorne roussâtre **German:** Rötelfeldhüscher **Spanish:** Sedosito Rufo  
**Other common names:** Rufous/Rock Fieldwren, Desert/Sandplain Wren, Field/White-lored Reed-  
Lark, White-lored Fieldwren, Rufous Calamanthus, Warrenbird, Rusty Calamanthus (*isabellinus*   
 *rubiginosus*).

**Taxonomy.** *Praticola campestris* Gould, 1841, plains around Adelaide, South Australia. Forms a superspecies with *C. fuliginosus* and *C. montanellus*. All three have often been treated as conspecific, especially present species and *C. montanellus*; further study required in order fully to resolve relationships within the genus. Races fall into groups on basis mainly of plumage characters: greyer "nominate group" (including also *rubiginosus*); rufous-brown and less streaked "republic group" (with *isabellinus*); pale "dun group" (with *hartogi*); and long-billed race *winiam*. Proposed race *ethelae* (Yorke and Eyre Peninsulas, in South Australia) synonymized with nominate. Seven subspecies recognized.

**Subspecies and Distribution.**

*C. c. rubiginosus* A. J. Campbell, 1899 – CW coast of Western Australia from Exmouth Gulf S to near Geraldton.

*C. c. dorrie* Mathews, 1912 – Dorre I, in Shark Bay (Western Australia).

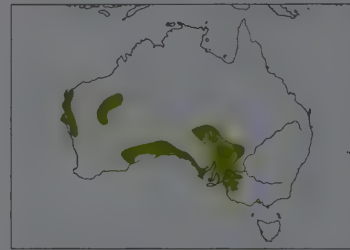
*C. c. hartogi* Carter, 1916 – Dirk Hartog I, in Shark Bay.

*C. c. wayensis* Mathews, 1912 – saltlakes between S Great Sandy Desert and Meekatharra–Sandstone, in C Western Australia.

*C. c. campestris* (Gould, 1841) – S Western Australia (Nullarbor Plain E from Balladoni-Israelite Bay) and S South Australia (E to coastal Eyre Peninsula and S Yorke Peninsula, S Flinders Ranges, S L Frome basin and W Murray–Mallee).

*C. c. isabellinus* North, 1896 – lower R Finke S to Coober Pedy, SW rim of L Eyre Basin and N part of L Frome basin, in South Australia.

*C. c. winiam* A. J. Campbell & A. G. Campbell, 1927 – SE South Australia (E from Meningie and the Coorong) and NW Victoria (Big and Little Deserts).



**Descriptive notes.** 11.5–13.5 cm; 14 g. A small, streaked acanthizid with short, stout bill, and long, slightly graduated tail usually held cocked. Nominative race has top of head rufous-brown (forehead slightly brighter) with fine dark brown streaks, nape and hindneck paler and browner, with dark streaking; lores white, small rufous-brown spot in front of eye, prominent white supercilium, narrow whitish arc around bottom of eye, rufous-brown ear-coverts; upperparts grey-brown (becoming more olive in E of range), tinged rufous or cinnamon, and with broad dark brown streaks, uppertail-coverts more rufous-brown and diffusely streaked; tail brown to greyish-brown, broad blackish subterminal band and narrow whitish tip; secondary upwing-coverts tipped whitish (forming narrow wingbar in fresh plumage), flight-feathers with buffy fringes (forming pale wingpanel), whitish tips of tertials; off-white below, breast side sometimes washed cinnamon-brown, rear flanks buff, undertail-coverts brownish, dark brown streaks from chin to lower breast and flanks; iris buff to orange-buff; bill grey-black, becoming paler brownish-grey on basal half of lower mandible; legs grey to pinkish-grey. Sexes similar in plumage, female on average smaller than male. Juvenile is similar to adult, but may have different gape colour. Races vary mainly in plumage coloration and degree of streaking: *rubiginosus* is extremely similar to nominate, perhaps marginally paler, wing slightly shorter; *isabellinus* is fairly large, more rufous above than nominate, crown sometimes unstreaked, streaks on back finer, finer and less extensive streaking below; *wayensis* resembles previous, but crown streaks slightly broader, underparts with strong buff suffusion; *hartogi* is paler than nominate, pale brownish-grey above, only faintly rufous on forehead, uppertail-coverts and tail base, dark streaks highly contrasting, whitish with moderate to fine streaking below; *dorrie* is very like last, but tarsus longer; *winiam* is large, with longish and slender decurved bill, plumage greyer than nominate, streaking above very prominent, broader and bolder streaking below. Voice. Song, evidently by both sexes, from top of shrub, apparently geographically variable: nominate race has whistled short trilled musical phrase, "chup-chup-wee-chup-wee" and variants; *rubiginosus* a simple "chup-chup-wee-chup-chup-wee-oo" and variants; *isabellinus* a throaty short "chup-chup-wee" and throaty musical phrase, also a cheerful musical whistled "chee-puh wee-wee-wee chew-wee" and variants. Alarm a harsh churring.

**Habitat.** Chenopod shrublands dominated by saltbush (*Atriplex*) and bluebush (*Maireana*), also samphire (*Sarcocornia*), heathland including mallee, and shrublands including paperbarks (*Melaleuca*), *Allocasuarina* and acacias (*Acacia*). Sometimes in spinifex (*Triodia*) under mallee, and in dwarf mangrove in Western Australia. Occurs on gibber plains and sandplains, in low ranges, and by saline or brackish wetlands.

**Food and Feeding.** Arthropods, including beetles (Coleoptera), bugs (Hemiptera), wasps (Hymenoptera), ants (Formicidae), lepidopterans and orthopterans, also spiders (Araneae); also snails (Gastropoda); also seeds of *Setaria*, *Erodium*, Caryophyllaceae and *Portulaca*, and solanaceous fruits. Usually seen singly, or in pairs or small family groups. Spends much time in foraging on the ground in lightly vegetated areas or on bare ground between shrubs; forages also low in shrubs and grass tussocks. Can be fairly confiding; runs or hops with tail held cocked, and frequently looks back; has been seen to hide down rabbit (*Oryctolagus*) burrows on Nullarbor Plain.

**Breeding.** Recorded in Jun–Apr, and possibly rainfall-dependent; may be double-brooded in years with good rainfall. Believed to breed as simple pair. Nest domed, with side entrance near top, of fine dry grass and/or bark strips, lined with feathers, wool, fur, plant down or insect cocoons; usually on ground under low shrubs or grass tussocks, or in slight depression in bare ground, sometimes in low vegetation, some nests hidden, others exposed, and seems to desert readily. Clutch 2–4 eggs, usually 3, light brown to purplish-brown or reddish-brown, indistinct darker spots and blotches on larger end, similar to those of *C. fuliginosus*; incubation probably by female, period unknown; nestling period uncertain, probably c. 17 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Black-eared Cuckoo (*Chrysococcyx osculans*), Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*), reportedly also by Shining Bronze-cuckoo (*Chrysococcyx lucidus*).

**Movements.** Resident; some local wandering owing to drought or grazing pressure seems possible. **Status and Conservation.** Not assessed. Uncommon and patchily distributed. Vulnerable to effects of overgrazing (although it tolerates severe conditions), habitat degradation, fire, land clearance, and feral predators such as cats. Races *dorrie* and *hartogi* restricted to small islands, and necessarily listed regionally as "Vulnerable"; in particular, *hartogi* exists along with sheep, goats, house mice (*Mus*) and feral cats, and requires careful monitoring. Possible decline of nominate race in Gawler Range of South Australia attributed to overgrazing and habitat degradation.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Christidis & Boles (1994), Eldridge & Pascoe (2004), Emission *et al.* (1987), Garnett & Crowley (2000), Higgins & Peter (2002), Keast (1978b), McCarthy (2006), McGill (1970), McGill (1935a), Morcombe (2003), Parker & Eckert (1983), Pizzey *et al.* (2005), Possingham & Possingham (1997), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003).

## 25. Western Fieldwren

### *Calamanthus montanellus*

**French:** Séricorne montanelle **German:** Westaustralien-Feldhüscher **Spanish:** Sedosito Occidental  
**Other common names:** Rock/Western Calamanthus

**Taxonomy.** *Calamanthus montanellus* Miligan, 1903, Stirling Range, south Western Australia.



Forms a superspecies with *C. fuliginosus* and *C. campestris*. All three have often been treated as conspecific, especially present species and *C. campestris*; further study required in order fully to resolve relationships within the genus. Monotypic.

**Distribution.** Western Australia S of a line drawn roughly from Geraldton SE to Point Culver (but excluding extreme SW corner).



**Descriptive notes.** 11.5–13.5 cm; 14 g. A small, streaked acanthizid with short, relatively fine bill, and long, slightly graduated tail usually held cocked. Male has forehead rufous-brown, olive-grey crown to hindneck streaked blackish; prominent white supercilium, narrow whitish arc around bottom of eye, very faint rufous tinge on ear-coverts; upperparts olive, rump tinged yellowish-brown, diffuse heavy dark streaking fading on rump; tail feathers with dark subterminal band and greyish-white tips; secondary upperwing-coverts tipped whitish (forming narrow wingbar in fresh plumage), flight-feathers with buffy fringes

(forming pale wingpanel), whitish tips of tertials; throat white, underparts pale yellow, flanks buffier, all with heavy dark brown streaks, undertail-coverts pale yellow or creamy with dark shaft streaks; iris light brown to creamy white; bill grey-black; legs grey to pinkish-grey. Female as male, or sometimes with creamy to faint yellow wash on supercilium, chin and throat. Juvenile resembles adult in plumage, but with streaking somewhat paler and less prominent. Voice. Distinctive; a musical short phrase, “per-chee chip ter chewee”, slightly upswept at end, different from that of *C. campestris*.

**Habitat.** Mallee and coastal heaths and woodland thickets and shrublands, including paperbarks (*Melaleuca*), *Allocasuarina* and acacias (*Acacia*); avoids wetter tall-timber areas such as jarrah and karri eucalypt (*Eucalyptus*) forests.

**Food and Feeding.** Largely insectivorous, also seeds, but details poorly known as species often subsumed in *C. campestris*. Arthropods taken include beetles (Coleoptera) and lepidopterans. Usually seen singly, or in pairs or small family groups. Spends much time in foraging on ground or in low bushes and shrubs; feeds also low down in grass tussocks. Behaviour similar to that of congeners.

**Breeding.** Season Jul–Dec; may be double-brooded in years with good rainfall. Domed nest with side entrance, made of coarse dry grass, dry leaves, flowerheads and plant stalks, lined with fine grass, feathers and kangaroo fur, placed on ground under low shrubs or grass tussocks, in depression on bare ground or in low shrub or bush. Clutch 2–4 eggs, usually 3, light brown to purplish-brown or reddish-brown, indistinctly marked with darker spots and blotches on larger end, indistinguishable from those of *C. fuliginosus*; incubation probably by female alone, no information on duration; no information on nesting period. Nests presumably parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Black-eared Cuckoo (*Chrysococcyx osculans*) and Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Resident.

**Status and Conservation.** Not assessed. Uncommon. Much of this species’ habitat has been cleared or modified for farming, and is now considerably fragmented. May survive for a time in remnants such as shelter-belts, but with increased vulnerability to fire, predators and vegetation change. Some populations are in protected reserves, such as Two Peoples Bay Nature Reserve and Stirling Range National Park. Conservation status probably merits listing as Near-threatened.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Christidis & Boles (1994), Garnett & Crowley (2000), Higgins & Peter (2002), McCarthy (2006), Morcombe (2003), Parker & Eckert (1983), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003), Whitlock (1911, 1912, 1921, 1922).

## Genus PYRRHOLAEMUS Gould, 1841

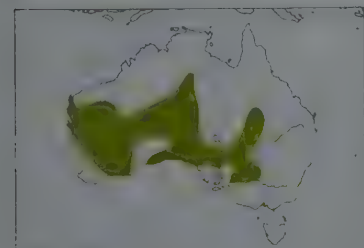
### 26. Redthroat

#### *Pyrrholaemus brunneus*

**French:** Sérissime rougegorge **German:** Dornhüschel **Spanish:** Sedosito Gorjirrojo  
**Other common names:** Red-throated Scrubwren

**Taxonomy.** *Pyrrholaemus brunneus* Gould, 1841, between Palmer and Caloot, South Australia. Some DNA traits and structural similarities to *Chthonicola sagittatus* suggest that closest relationship is with latter species. Monotypic.

**Distribution.** Arid and semi-arid regions of Australia: much of W & C Western Australia (including Great Sandy and Gibson Deserts) E to extreme S Northern Territory, and patchily in South Australia, SW Queensland and W New South Wales.



**Descriptive notes.** 10.5–12.5 cm; 12 g. Appears like a greyish-brown long-tailed scrubwren with broad white corners of dark tail. Male has brownish-grey head and neck, with fine off-white scalloping and fine dusky speckling on forehead; creamy lores, narrow white eyering; dark grey-brown upperparts, slightly browner on rump and uppertail-coverts; tail contrastingly blackish-brown, broad white tips on outer four pairs of rectrices; pale panel on primaries (in fresh plumage), narrow pale wingbar on greater secondary wing-coverts; mostly light grey below, with dull brick-red patch on chin and centre throat (can be hard

to see in bright light), whitish centre of belly, pale buffy sides grading to richer buff on flanks and vent and to cream or buff on undertail-coverts; undertail dark grey, white tips as on upper surface; iris red-brown to pale brown or yellow-brown; bill black or grey-black, sometimes pinky-brown lower mandible; legs black, sometimes brown, dark grey-brown or dark flesh-coloured. Female is similar to male but lacks red throat patch, throat being off-white or cream. Juvenile is similar to female but lacks forehead markings, has head browner, smaller white tail tips, buffy wingbar. Voice. Vocal during breeding season, less so outside it, and reportedly sings on moonlit nights and after

rain. Song, by both sexes (but male voice sweeter and more sustained), a sustained sweet, melodious, whistled warbling (almost like that of an *Acrocephalus* warbler) with short dry rattly notes, beginning often with “whit-whit-chee-chee” and then changing into long song phrases interspersed with rattling notes; accomplished mimic, recorded as mimicking *Calamanthus montanellus* song and alarm notes of Grey Fantail (*Rhipidura albiscapa*), and one male incorporated perfectly copied notes of Pied Butcherbird (*Cracticus nigrogularis*) into song. Harsh dry rattling “churr” used also as alarm note, and may give sweet twitter when foraging.

**Habitat.** Arid and semi-arid acacia (*Acacia*) and chenopod scrublands, often along watercourses or drainage lines. Occurs on plains, inland ranges and some coastal areas of C Western Australia. Occupies acacia shrublands with mulga (*Acacia aneura*), mineritche (*Acacia cyperophylla*), lancewood (*Acacia shirleyi*), dead finish (*Acacia tetragonophylla*), wanya (*Acacia linophylla*), jam (*Acacia acuminata*), snakewood (*Acacia cuthbertsonii*) and western myall (*Acacia papyracarpa*). Often associated with chenopods, especially saltbush (*Atriplex*) and bluebush (*Maireana*) or emu-bush (*Eremophila*). Occurs also in some woodlands, especially mallee with diverse heath shrub layer, and some eucalypt (*Eucalyptus*) formations with a good shrub layer. Sometimes in paperbark (*Melaleuca*) thickets and semi-arid heathlands, such as unburnt desert banksia (*Banksia ornata*) and mallee tea-tree (*Leptospermum laevigatum*) at base of dunes. Occasionally recorded in spinifex (*Triodia*) or canegrass (*Zygochloa*) grassland, and tangled lignum (*Muehlenbeckia cunninghamii*) thickets.

**Food and Feeding.** Mainly arthropods and seeds. Arthropods taken include beetles (Coleoptera), flies (Diptera), cicadas (Cicadidae), plant lice (Psyllidae), wasps (Hymenoptera), ants (Formicidae), ichneumons (Ichneumonidae), termites (Isoptera), lepidopterans and orthopterans; some gastropods also taken. Seeds taken include those of chenopods and of genera *Scirpus*, *Panicum*, *Setaria*, *Aster*, *Centaurea* and *Portulaca*. Forages singly, in pairs or in small parties. Feeds in low shrubs and while hopping on ground; sometimes in low branches of trees. Food items obtained by gleaning and by sallying into air or to ground. Accompanies mixed-species feeding flocks, including those with *Acanthiza* species and *Aphelocephala leucopsis*.

**Breeding.** Breeds in Mar–Dec, mostly Jul–Dec, and especially after rain; sometimes double-brooded. Nests in pairs. Nest a globular dome, with side entrance and sometimes a hood, made from bark and dried grass, lined with feathers, wool, hair, fur or fine plant fibres, placed on or near ground (usually within 1 m of ground, but recorded to 6.4 m above it) in low shrub or grass tussock, sometimes in fallen hollow tree branch; saltbush, bluebush, acacia or tea-tree utilized, as well as clumps of spinifex or spear grass (*Sida*), seeming to like shrubs with grass growing through them. Clutch 2–4 eggs, usually 3, dark greyish-brown to dark olive-brown, slightly lighter towards narrow end and slightly lustrous; incubation by female only, period unknown; nesting period not documented, believed possibly c. 13 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Black-eared Cuckoo (*Chrysococcyx osculans*). Recorded longevity in ringing studies at least 5 years 4 months.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Widespread but at low density, and uncommon; inconspicuous in arid and semi-arid habitats over huge area of W & C Australia. Populations have decreased in many parts of range as a result of overgrazing, habitat clearance and degradation; declines especially marked in Western Australia wheatbelt, New South Wales and Victoria. Feral cats may be a problem, as their density is high in some arid areas. Occurs in West McDonnell (Ormiston Gorge) and Flinders Ranges National Parks.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker & Brooker (1989), Carpenter & Matthew (1997), Chisholm (1946), Christidis & Boles (1994), Ford & Parker (1974), Ford & Sedgwick (1967), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Matthew & Carpenter (1990), McGill (1970), Morcombe (2003), Parker (1969), Pizzey *et al.* (2005), Saunders & Ingram (1995), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Whitlock (1922).

## Genus CHTHONICOLA Gould, 1847

### 27. Speckled Warbler

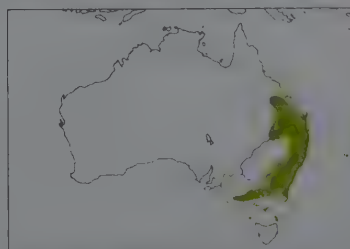
#### *Chthonicola sagittatus*

**French:** Sérissime fléché **German:** Grundhüschel **Spanish:** Sedosito Moteado  
**Other common names:** Australian Speckled Warbler, Little/Speckled Fieldwren, Streaked Warbler, Chocolate-bird, Speckled Jack

**Taxonomy.** *Sylvia sagittata* Latham, 1801, Port Jackson area, New South Wales, Australia.

Sometimes placed in genus *Pyrrholaemus* on grounds of structural similarities and some DNA traits in common with latter. Monotypic.

**Distribution.** E Australia from E Queensland S to SW Victoria; mainly on slopes and tablelands of Great Dividing Range.



**Descriptive notes.** 11–12.5 cm; 13.5 g. Distinctive aberrant streaked acanthizid, appearing large-eyed and pale-faced. Male has whitish forehead, dark brown crown with narrow pale streaks, black lateral crownstripe extending to hindneck, long narrow off-white supercilium; ear-coverts light grey-brown to darker brown, diffuse dark patch at lower rear corner; olive-grey upperparts with bold but diffuse blackish streaking, merging into more uniformly yellowish-brown rump and uppertail-coverts; grey-brown tail with broad dark brown subterminal band and narrow white tip (tip often lost with wear); outer primaries with

pale edgings (forming diffuse pale wingpanel); off-white below, creamy wash on chin, throat and breast, buff wash on flanks, all boldly marked with short black streaks (form wavy lines on breast and flanks); iris red-brown, less often brown to pale yellow or cream; bill grey-black to grey-brown, often slightly paler base; legs variable, from dark grey to pinky brown with contrasting dark grey feet. Female is similar to male, but has black lateral crownstripe edged rufous above and behind eye. Juvenile is similar to female, but top of head diffusely spotted or streaked creamy. Voice. Song a sweet musical twittery phrase 4–8 seconds long with some quiet, dry, harsh tearing scolds, by both sexes, but male song louder, more protracted and given more frequently; frequently mimics (and has been known to sing and mimic when held in the hand for ringing). Calls include harsh chatter, single plaintive whistle, and harsh single-note alarm; flight call a short “pip”.



**Habitat.** Dry sclerophyll eucalypt (*Eucalyptus*) forests and woodlands with grassy ground layer and scattered shrubs, mainly on slopes and tablelands, extending to semi-arid plains and floodplains inland, with preference for rocky ridges and gulleys. Sometimes in mallee with cypress pine (*Callitris*), and in dense acacia (*Acacia*) shrubland. Ground layer evidently important, with grass, bracken (*Pteridium*) and sedges and golden wattle (*Acacia pycnantha*) saplings preferred in some areas. Sometimes occurs in towns and gardens.

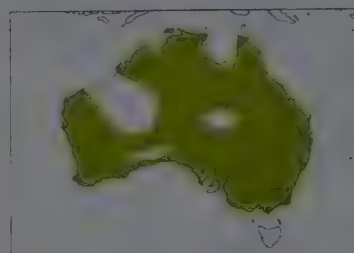
**Food and Feeding.** Insectivorous, but will take seeds and plant material. Major prey items beetles (Coleoptera), wasps and winged ants (Hymenoptera), lepidopteran larvae, mantids and grasshoppers (Orthoptera); plant material taken includes seeds of chenopods and of genera *Panicum*, *Eragrostis*, *Setaria*, *Rubus*, *Pandanus* and *Hybanthus*. Usually in pairs or in small parties of up to six individuals. Feeds by gleaning and probing leaf litter while hopping on ground; also forages in shrubs, saplings, grass tussocks and fallen timber. Will sally after flying insects. Prey swallowed whole, or dismembered if too large. Readily joins mixed-species flocks, especially in non-breeding season, including those with *Acanthiza* species, Eastern Yellow Robin (*Eopsaltria australis*), Scarlet Robin (*Petroica boodang*), *Sericornis frontalis*, Yellow-faced Honeyeater (*Lichenostomus chrysops*), Spotted Pardalote (*Pardalotus punctatus*), Silveryeye (*Zosterops lateralis*), *Smicrornis brevirostris* and *S. alpestris* at other woodland species.

**Breeding.** Recorded in all months except May, with distinct peak Sept–Nov; up to three broods per season. Breeds as simple pair or as trio; trio consists of one female and two males (members of such groups unrelated), secondary male not assisting in brood-rearing, breeding system thus polyandrous, rather than co-operative. Nest domed, with side entrance, sometimes forming a short tunnel, made of bark, dried grass, leaves and moss, lined with feathers, fur, downy grass and feathery seeds, average external diameter variously 10.2 cm or 11.4 cm, external depth 7.6 cm or 8.3 cm, entrance diameter 2.5 cm; well concealed in small depression on ground among grass tussocks (32 out of 57 nests in Nest Record Scheme), shrubs, fallen branches, rocks or leaves, often at base of plants and sheltered by trees or shrubs, site often reused, but makes new nest annually and when making new breeding attempt. Clutch 2–4 eggs, usually 3, highly distinctive, light or dull ochraceous-red, bright chocolate-red, brownish-terracotta or chocolate-brown, sometimes with darker cap at large end; incubation by female alone, period 17–20 days; chicks brooded by female, fed by female and primary male, nestling period 15–19 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Black-eared Cuckoo (*Chrysococcyx osculans*).

**Movements.** Resident; possibly some local wandering caused by drought or fire.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Although relatively abundant, with estimated global population of as many as 400,000 individuals, density is declining throughout range. Historically, flocks containing more than 50 individuals were recorded in autumn (Mar), but no such recent records. Negative factors are habitat clearance for timber, stock and urban development, resulting in arrival of invasive plant species and predator increase; also, overgrazing leading to salinization, and changes to vegetation structure and composition, are contributing to habitat fragmentation and degradation, to which this acanthizid appears particularly vulnerable. Effects of drought and fire may also be significant, particularly as habitat becomes more patchy and prone to damage.

**Bibliography.** Anon. (1999b, 2006a, 2007a, 2007c), Barrett *et al.* (2003), Bell (1984b), Beruldsen (2003), Blikers *et al.* (1984), Buchanan & Stattersfield (2004), Chisholm (1946), Christidis & Boles (1994), David & Gosselin (2002b), Emission *et al.* (1987), Ford, H.A. (1985), Ford, H.A. *et al.* (1986), Frith (1969), Gardner (2002, 2004), Gardner *et al.* (2004), Garnett (1993), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Joseph (1992), McGill (1970), Morcombe (2003), North (1904), Olsen *et al.* (2005), Parker (1980b), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Stattersfield & Capper (2000), Tzaros (1996).



spicuous off-white supercilium tapering behind eye, ear-coverts light brown; upperparts olive to greyish-olive (contrasting with crown), pale olive-yellow at base of uppertail-coverts; uppertail dark brownish-grey, broad black sub-terminal band; upperside dark brown, narrow pale yellowish fringes on secondary coverts and tertiaries, finer yellowish edges on remiges; chin and throat off-white with variable fine short dusky streaking; breast creamy to very pale yellow (sometimes brownish at side), grading to richer yellow on belly and vent and brighter yellow on flanks; undertail-coverts creamy, undertail dark grey with broad white tips; iris

creamy or pale yellow; bill grey-brown to dark brown, often paler pinky-brown lower mandible; legs dark grey or pinkish-grey to dark brown. Sexes alike. Juvenile has duller head and upperbody with brownish cast, richer yellow fringes on tertiaries, underside paler, throat lacking streaks, iris dull grey or lime-green. Races differ mainly in colour tone: *occidentalis* is very like nominate, but top of head often slightly darker, has side or all of breast suffused with grey, breast centre usually streaked; *flavescens* is much paler and yellower than others, yellow-olive above (top of head contrasting less with upperparts), supercilium and lores off-white to pale yellow, no dusky loral spot, ear-coverts only faintly washed brown, chin, throat and undertail-coverts unstreaked pale yellow, merging into brighter yellow rest of underparts, bill very pale, flesh-brown or horn-coloured, lower mandible sometimes pale pink; *ochrogaster* is smaller, shorter-tailed and paler than others, a washed-out version of nominate, having pale olive upperparts contrasting less with top of head, loral spot and ear-coverts paler brown, chin to breast off-white with little or no yellow tinge and streaking faint or absent, bill slightly paler. Voice. Song given particularly on hot sunny days, a loud, liquid rich musical "pee-pee p'wee weep" (latter part sounding like "wee bill"), transcribed also as "weebit, weebie" or "willy weet, willy weet"; in duet, one individual (probably male) makes first part and probable female answers with second part. Trill calls (given more on overcast days, and early and late in day), act as contact and alarm, may be interspersed with song phrases. Also gives fast quite deep "tidid tidid"; continual "tiz tiz" when foraging, and soft "chip chip" often given in flight; high-pitched "trip", often as prelude to trill.

**Habitat.** Wide range of wooded habitats, particularly eucalypt (*Eucalyptus*) woodlands, also dry sclerophyll woods, mallee and mulga habitats, sometimes in moist sclerophyll eucalypt forest and acacia (*Acacia*) shrublands; commoner in semi-arid than in arid zone, where mainly confined to drainage lines; typically avoids most types of rainforest and monsoon forest. Sometimes in riparian woods with pandanus (*Pandanus*), eucalypts, paperbarks (*Melaleuca*), casuarinas (*Casuarina*) and figs (*Ficus*). Occasionally found in farmland and suburban areas where suitable trees survive.

**Food and Feeding.** Arthropods, also some seeds. Prey items include spiders (Araneae), beetles (Coleoptera, including curculionids), flies (Diptera, including calliphorids), bugs (Hemiptera, including Lygaeidae), wasps (Hymenoptera, including chalcids), grasshoppers (Orthoptera), ants (Formicidae) and caterpillars (Lepidoptera), and various homopteran bugs including e.g. cicadellids, lanternflies (Fulgoroidea), cercopids, lerp insects (Psyllidae), aphids (Aphididae). Usually seen singly, in presumed pairs or in small groups up to ten individuals; post-breeding flocks of 10–18 (and historically up to c. 30) recorded. Forages in canopy and subcanopy, sometimes descending to middle and lower levels, and occasionally on ground. Food obtained primarily by gleaning among foliage, sometimes on branches and trunks; occasional brief hover-sallying, or sally-striking after specific items. A core member of mixed feeding flocks, including those with *Acanthiza* species, Grey Fantail (*Rhipidura albiscapa*), Rufous Whistler (*Pachycephala rufiventris*), Spotted Pardalote (*Pardalotus punctatus*) and Striated Pardalotes (*Pardalotus striatus*), and in Western Australia also Western Spinebill (*Acanthorhynchus superciliosus*). May be hard to see, as so small, active and high up; incessant calling a good first indicator of its presence.

**Breeding.** Eggs recorded in all months but primarily Aug–Dec, timing of laying may vary according to rainfall (which is sporadic over much of range); suggestion that may breed more in austral autumn in N of range and more in spring in S. Usually solitary nester; usually two adults attend nest, but many reports of at least sporadic communal or co-operative breeding, with helpers at nest. Nest built by both sexes, sometimes with helpers, taking 6–15 days, domed and with hooded side entrance near top (reported also as purse-like or hooded cup with slit near top), made from grass, leaves, stems, wool, flowers, grass-heads, moss, fibre, bark, feathers, spider webs and egg sacs, also sometimes feathers and lichen, lined with feathers but wool or other soft material also used, external diameter c. 6.4 cm and length 7.6 cm (variable, up to 7.5 cm wide and 10 cm high); suspended from drooping branch or twigs, sometimes among upright bunches of twigs, usually in foliage of crown of tree, sapling or tall shrub, but sometimes in twigs or flowers and less often on lower branches, most in eucalypt (over 35 species recorded as used, and black box a favourite) but many other species occasionally utilized e.g. wattles, acacias, tea-trees (*Leptospermum*) and casuarinas; association with the communal spider *Badumna candida* noted in SW New South Wales and NW Victoria, where 12 of 17 nests were built against nests of this spider. Clutch 2–4 eggs, sometimes more (may be product of more than one female), clutch size reportedly increasing from N to S, mean in Queensland 2.2, in New South Wales 2.55, in Victoria 2.5, in Australian Capital Territory 2.7 and in South Australia 2.64; laying interval c. 48 hours, egg colour variable, creamy to pinkish-buff, brownish or stone-grey with tiny buff-brown to slate-grey freckles usually at larger end (sometimes over whole shell); incubation by both sexes, perhaps by female alone at some nests, from final or penultimate egg, period c. 18–21 days; all eggs hatch within 24-hour period, chicks fed by both sexes, nestling period 17–20 days; young may return to nest to roost for several days after fledging. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Shining Bronze-cuckoo (*Chrysococcyx lucidis*). Success rate moderate to poor: of 267 eggs in 109 nests, 93 (34.8%) hatched and 39 (14.6%) produced fledged young; in other samples, of 385 eggs from 154 nests 185 (48.1%) hatched, and of 213 nests 155 (c. 73%) failed and only 58 (c. 27%) fledged at least one young; of 40 nests in one study, 55.2% failed, causes of failure being equally predation and desertion (each 27.6%).

**Movements.** Resident, some local movements reported in N Queensland and S Western Australia. Around Canberra, individuals sometimes seen in marginal habitat or high up in Great Dividing Range, well outside usual range.

**Status and Conservation.** Not globally threatened. Common and widespread over much of Australia. Local declines have been noted (as with many other woodland birds), these being consequent upon habitat clearance and degradation; the resultant fragmentation encourages spread of feral predators such as cats, and makes it easier for avian predators such as currawongs (*Sturnera*) to raid nests. Probably secure in the medium term, but numbers may have dwindled as, unlike in earlier years, there appear no longer to be reports of large flocks.

**Bibliography.** Anon. (1999b, 2007c), Bryant (1934), Carter (1924b), Chisholm (1938), Christidis & Boles (1994), Courtney & Marchant (1971), Daw (1980), Emission *et al.* (1987), Hall (1974a), Hobbs (1990), Keast (1958d), McCrie & Watson (2004), McGill (1970), McGill (1935b), Morcombe (2003), North (1903), Olsen *et al.* (2005), Powys (1999), Recher & Majer (1994), Schodde & Mason (1999), Serventy & Whittell (1976), Slater *et al.* (2003), Woinarski (1989b, 1993), Woinarski *et al.* (2000).

## Subfamily ACANTHIZINAE

### Genus *SMICRORNIS* Gould, 1843

#### 28. Weebill

##### *Smicrornis brevirostris*

**French:** Gégène à bec court    **German:** Stutzschnabel    **Spanish:** Gerigón Piquicorto  
**Other common names:** (Greenish) Tree-tit, Central Australian Tit, Western/Tinted Scrubtit; Brown Weebill, Brown/Short-billed/Southern Scrubtit (C & S races); Yellow Weebill, Yellow/Yellow-tinted Scrubtit (N races)

**Taxonomy.** *Psilopus brevirostris* Gould, 1838, Sydney region, New South Wales, Australia. Has in the past been considered to comprise two species, "*flavescens* group" in N parts of range and nominate and others in C & S. Geographical variation complex, and often clinal, races *flavescens* over wide areas, e.g. recently described pale form *ochrogaster* may be part of a cline of yellow and less greyish coloration from S to N, as it intergrades extensively in W Western Australia with *occidentalis*; genetic work required in order to determine validity of races and to help in resolving subspecific taxonomy. Extensive nature of intergradation has led to the naming of up to nine races; proposed races *stirlingi* (from SW Australia), *cairnsi* (subhumid highlands of NE Queensland), *minnerleyi* (interior parts of Queensland), and *mallee* (mallee areas of SW New South Wales, Victoria and adjacent South Australia) are now considered to be based on intermediates; pale form, recently renamed *ochrogaster*, was formerly listed as *diatensis*, but latter name was described from intergrade zone between *ochrogaster* and *flavescens*, and type shows strong feathered legs. Four subspecies currently recognized.

##### **Subspecies and Distribution**

*S. b. brevirostris* Gould, 1843: N Australia from Kimberley Divide (Western Australia) E, including Tiwi Is (Bathurst I, Melville I), to N & W Queensland (Cape York Peninsula, including dry forest of NE, and S on Great Sandy and Timmi Deserts). C Australian ranges: N Simpson Desert and C Thicket drainage.

*S. b. ochrogaster* Schodde & Mason, 1999: W & C Western Australia (S from Pilbara).

*S. b. brevirostris* (Gould, 1838): F Australia from C & E Queensland (Burdekin drainage) S to Victoria and SE South Australia.

*S. b. occidentalis* Bonaparte, 1850: SW Western Australia (S from lower R Murchison and Falgout rivers) N around S river Nullarbor Plain to South Australia (S from C Flinders Ranges, L Frome Basin and Murray-Mallee).

**Diagnostic notes.** — in C & S, the acanthizid resembling *Acanthiza* species, but with short stubby pale bill often concealed in the gape. Australian powerline. Nominative race has top of head greyish, merging into greyish-olive on side of neck, most of lores white, diffuse dark brown loral spot, con-







# Genus *GERYGONE* Gould, 1841

## 29. Rufous-sided Gerygone

### *Gerygone dorsalis*

**French:** Gerygone à flancs roux **German:** Rostflankengerygone **Spanish:** Gerigón Flanquirrufo  
**Other common names:** Lesser Sunda/Tanimbar Gerygone, Rufous-sided Flyeater/Fairy-warbler

**Taxonomy.** *Gerygone dorsalis* P. L. Slater, 1883, Larat Island, Tanimbar Archipelago. Seems to be closer to *G. chrysogaster* or *G. magnirostris* than to the *G. igata* superspecies; has sometimes been considered conspecific with *G. inornata*, but probably not closely related. Five subspecies recognized.

#### Subspecies and Distribution.

*G. d. senex* Meise, 1929 – islands of Kalaotoa and Madu, N of Flores (Lesser Sundas).  
*G. d. fulvescens* A. B. Meyer, 1884 – E Lesser Sundas (Romang, Kisar, Leti, Moa, Sermata, Babar).  
*G. d. kuehni* E. J. O. Hartert, 1900 – Damar I (E Lesser Sundas).  
*G. d. dorsalis* P. L. Slater, 1883 – Tanimbar Is.  
*G. d. keyensis* Büttikofer, 1893 – Kai Is (including Tayandu Group).

**Descriptive notes.** 10 cm. Has short pale supercilium not extending behind eye, narrow pale eyering; crown olive-brown, rest of upperparts, including upperwing, reddish-brown; tail red-brown, inconspicuous pale subterminal spots on outer rectrices; white below, pale rufous-ochre on breast side and flanks; iris variously red-brown, dark grey or yellow-grey; bill blackish-grey; legs dark greyish. Sexes alike. Juvenile has underparts washed pale yellow. Races differ minimally in size and plumage colour: *kuehni* darker and duller above, with greyer brown crown and somewhat redder sides and flanks; *fulvescens* very similar to previous, but slightly less reddish on upperparts and on sides and flanks; *senex* extremely similar to previous, possibly slightly duller and greyer above, with darker, ashier crown; *keyensis* slightly larger, but otherwise barely separable. Voice. Song a sibilant even-pitched semi-trilled monotonous series, also a complex rather slow series of slightly warbled notes.

**Habitat.** Fairly catholic in habitat preferences, occupying lowland and coastal forest, forest edge, secondary forest, partly cleared areas, lightly wooded cultivation and mangroves. Has a liking for vine tangles in dense forest.

**Food and Feeding.** Poorly known. Largely insectivorous. Usually seen in pairs, often with Yellow-bellied White-eye (*Zosterops chloris*) in Kai Is and with mixed-species flocks in Tanimbar Is. Gleans under leaves in middle storey, 2–6 m up, and in vine tangles in dense forest. Flicks tail and wags it slowly up and down.

**Breeding.** No information. Likely to be parasitized by Little Bronze-cuckoo (*Chrysococcyx minutillus*), but as yet unproven; this seems particularly likely in Kai, Tayandu and Tanimbar Is, where immature of local form (*crassirostris*) of the cuckoo resembles present species.

#### Movements.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Banda Sea Islands EBA and Salayar and Bonerate Islands Secondary Area. Quite common within limited range. Seems able to tolerate a wide spectrum of altered habitats, but recently found to be apparently absent from Kai Besar and Kai Kecil. Potentially vulnerable, as small-island habitats locally prone to man-induced clearance and vegetation changes.

**Bibliography.** Coates & Bishop (1997), Finsch (1898), Hartert (1901), Meise (1929, 1931a), Meyer (1884), White & Bruce (1986).

## 30. Yellow-bellied Gerygone

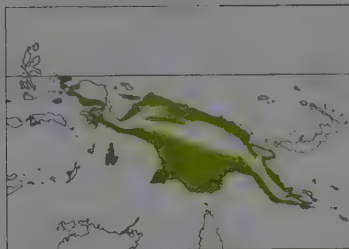
### *Gerygone chrysogaster*

**French:** Gerygone à ventre jaune **German:** Gelbbauchgerygone **Spanish:** Gerigón Ventrigualdo  
**Other common names:** Yellow-bellied Flyeater/Fairy-warbler, Yellow-bellied (Gerygone) Warbler; Waigeo Gerygone (*neglecta*); White-bellied Gerygone (*notata*); Rusty-tailed/Rufous-tailed Gerygone, Rufous-tailed Flyeater/Fairy-Warbler (*G. ruficauda*)

**Taxonomy.** *Gerygone chrysogaster* G. R. Gray, 1858, Aru Islands. Proposed species *G. ruficauda*, supposedly from NE Australia ("Thirteen Mile River", in E Queensland), was based on incorrectly labelled specimens of present species discoloured (faded) by preservative spirit. Five subspecies recognized.

#### Subspecies and Distribution.

*G. c. neglecta* Wallace, 1865 – N West Papuan Is (Waigeo I), in NW New Guinea.  
*G. c. notata* Salvadori, 1878 – C & S West Papuan Is (islands of Batanta and Misool) and NW New Guinea (Vogelkop).  
*G. c. dohertyi* Rothschild & E. J. O. Hartert, 1903 – SW New Guinea (Onin Peninsula E to Triton Bay).  
*G. c. leucothorax* Mayr, 1940 – lowlands of Geelvink Bay region (W New Guinea).  
*G. c. chrysogaster* G. R. Gray, 1858 – Yapen I (in Geelvink Bay), N, S & SE New Guinea, and Aru Is.  
**Descriptive notes.** 10 cm. Nominative race is brownish-olive above, upperwing and tail brownish, greyer on cheek, with narrow pale supraloral stripe, thin pale eyering almost broken at sides; chin, throat and breast greyish-white, quite well demarcated from pale yellow belly, flanks, vent and undertail-coverts; iris red-brown; bill black; legs pale horn to fleshy purple. Sexes alike. Juvenile has ear-coverts greyer, less brownish, than adult. Races vary in general coloration: *neglecta* has entire underside washed very pale yellow, colour strongest on flanks; *notata* appears brown, not



olive, above and whitish below, with horn-coloured bill; *dohertyi* greener above than nominate, with browner cheeks, faint pale margins on some wing-coverts, paler yellow below; *leucothorax* intermediate between previous and nominate. Voice. Song, one of characteristic sounds of New Guinea lowland rainforest but hard to pinpoint, a sweet, slow, repetitive, thin, musical series of a few rising notes followed by a falling series, and varying geographically. Series of dry, rather nasal notes, some higher-pitched and some lower, as contact during foraging.

**Habitat.** Rainforest, secondary growth, monsoon forest and riparian formations, from sea-level to, rarely, c. 760 m; much commoner in lowlands.

**Food and Feeding.** Insectivorous, but no details of prey. Occurs singly, in pairs or in small groups up to five individuals. Keeps mainly in middle storey but can range both low and high. Very active, gleaning particularly from leaves (76% of time at R Brown study site, in SE New Guinea), also from twigs and branches (23%), sometimes hovering and occasionally sallying (1%). Sympatric in some places with *G. palpebrosa*, but tends to forage lower in trees than does latter; *G. chloronota* more on edges and in drier or secondary forest. Often the nucleus of mixed feeding flocks, occurring most frequently with Frilled (*Arses telescopthalmus*) and Spot-winged Monarchs (*Monarcha guttula*), Chestnut-bellied (*Rhipidura hyperythra*) and Northern Fantails (*Rhipidura rufiventris*) and Grey Whistler (*Pachycephala simplex*) at R Brown site; forages also with Yellow-breasted Boatbill (*Machaerirhynchus flaviventer*), various other *Monarcha* species, Little Shrike-thrush (*Colluricincla megarrhyncha*), Wallace's Wren (*Sipodotus wallacii*), Spangled Drongo (*Dicrurus bracteatus*), Hooded Pitohui (*Pitohui dicrous*), *Sericornis spilodera* and *G. palpebrosa*; expanded flocks may include Goldenface (*Pachycare flavogriseum*), Pygmy Drongo (*Chaetorhynchus papuensis*), Green-backed Honeyeater (*Glycichaera fallax*), Little Bronze-cuckoo (*Chrysococcyx minutillus*) and Raggiana Bird-of-paradise (*Paradisaea raggiana*).

**Breeding.** Recorded in both dry and wet seasons, Aug–Sept, Feb and May. Nests as pair; possibly an occasional co-operative breeder, as four individuals noted as feeding fledgling at R Brown site. Nest a neat hanging oval, with short downward-directed "spout" leading to side entrance near top, composed of fibrous matter bound with spider webs, lined with fine soft fibres, and with long "tail" dangling below. Clutch size poorly known, but 3 eggs recorded; no information on incubation and fledging periods.

**Movements.** Resident; some local wandering, as recorded rarely at 760 m in hill forest at Tabubil, in C New Guinea.

**Status and Conservation.** Not globally threatened. Common in lowland rainforest over a huge area of New Guinea.

**Bibliography.** Beehler *et al.* (1986), Bell (1970b, 1982d, 1983, 1984a, 1984c), Coates (1990), Ford & Johnstone (1983), Gregory (1995a), Gyldestolpe (1955b), Hartert (1930), Hartert *et al.* (1936), Hopkins & Hiaso (1994), Mayr (1940), Mayr & Rand (1937), Mees (1965), Meise (1931a), Rand & Gilliard (1967), Schodde (1985), Stresemann & Paludan (1932a, 1932b).

## 31. Brown Gerygone

### *Gerygone mouki*

**French:** Gerygone brune **German:** Grauwangengerygone **Spanish:** Gerigón Pardo  
**Other common names:** Brown Fairy-warbler, Brown/Northern/Queensland Flyeater, Brown (Gerygone) Warbler; Northern Gerygone/Warbler (*mouki*)

**Taxonomy.** *Gerygone laevigaster mouki* Mathews, 1912, Cairns, north-east Queensland, Australia. Forms a superspecies with *G. igata*, possibly including also *G. albofrontata* and, perhaps, *G. modesta*. With exception of *G. albofrontata*, these were once considered (together with the extinct Lord Howe I species *G. insularis*) to be conspecific, but they differ significantly in plumage and song. Three subspecies recognized.

#### Subspecies and Distribution.

*G. m. mouki* Mathews, 1912 – NE Queensland (from Mt Amos S to Paluma), in NE Australia.  
*G. m. amalia* Meise, 1931 – Clarke Range S to Connors Range, in E Queensland.  
*G. m. richmondi* (Mathews, 1915) – coastal and subcoastal E Australia from SE Queensland (Dawes Range) S, inland to E scarps of Great Dividing Range, to Victoria (W Gippsland).

**Descriptive notes.** 9–11 cm; 5.5 g. The smallest Australian gerygone. Nominative race is olive-brown above, slightly tinged greyish; black loreal line, pale supercilium extending to just behind eye, greyish-brown face and side of neck; tail more or less as back, with broad blackish subterminal band, all rectrices except central pair with large white spot near tip on inner web; off-white below, breast and flanks with faint buff wash, creamy undertail-coverts; iris brick-red or rich brown; bill black; legs olive-grey to black, soles yellowish. Sexes alike. Juvenile is very similar to adult, but with duller or paler iris. Races distinguished by minor biometric and plumage differences: *richmondi* has longer tail and shorter bill than nominate, is somewhat greyer on head side than nominate, upperparts tinged russet (in fresh plumage), grey wash on upper breast; *amalia* is very similar to previous, differing in longer bill, face slightly less greyish, slightly greyer (less rich olive-brown) above, throat whiter, paler below, only faint buff wash on lower breast and flanks. Voice. Song, throughout year (reportedly by both sexes in breeding season), a twittering flat "what-is-it, what-is-it", lacking sweet and musical quality of congeners, or a soft rather uniform flat-pitched twitter of 3–5 syllables, "diddle-it-did-it"; evidently used



On following pages: 32. Grey Gerygone (*Gerygone igata*); 33. Chatham Gerygone (*Gerygone albofrontata*); 34. Norfolk Gerygone (*Gerygone modesta*); 35. Dusky Gerygone (*Gerygone tenebrosa*); 36. Mangrove Gerygone (*Gerygone levigaster*); 37. Fan-tailed Gerygone (*Gerygone flavolateralis*); 38. Western Gerygone (*Gerygone fusca*); 39. Large-billed Gerygone (*Gerygone magnirostris*); 40. Biak Gerygone (*Gerygone hypoxantha*); 41. Golden-bellied Gerygone (*Gerygone sulphurea*); 42. Plain Gerygone (*Gerygone inornata*); 43. Brown-breasted Gerygone (*Gerygone ruficollis*); 44. Mountain Gerygone (*Gerygone cinerea*); 45. Green-backed Gerygone (*Gerygone chloronota*); 46. Fairy Gerygone (*Gerygone palpebrosa*); 47. White-throated Gerygone (*Gerygone olivacea*).



also as contact call. Mimicry of Yellow-faced Honeyeater (*Lichenostomus chrysops*) and Eastern Yellow Robin (*Eopsaltria australis*) reported.

**Habitat.** Primarily rainforest, also other wet forests, gulleys and riparian vegetation, moving to non-rainforest habitat in non-breeding season. Occasionally found in mangroves and dry sclerophyll forest. From coast to slopes and tablelands of Great Divide; nominate race more often in hills above 1000 m than on coast.

**Food and Feeding.** Insectivorous. Takes beetles (Coleoptera), flies (Diptera), bugs (Hemiptera), lepidopteran larvae, wasps and ants (Hymenoptera), and lepidopteran larvae. Usually seen in twos, probably pairs, and in small parties of up to six individuals. Occurs from understorey to canopy, tending to keep higher up; not reported as foraging from ground. Active and noisy, birds frequently chasing each other, with wing-shaking and tail-flicking. Forages mostly by gleaning from foliage and bark on trunks and branches; some aerial sallying. Joins mixed-species flocks with *Sericornis magnirostris*, Yellow-spotted Honeyeater (*Meliphaga notata*), Pale-yellow Robin (*Tregellasia capito*), *Acanthiza katherina*, Grey Fantail (*Rhipidura albiscapa*) and Yellow-breasted Boatbill (*Machaerirhynchus flaviventris*).

**Breeding.** Season Jun–Feb, mostly Sept–Dec, earlier in tropics than in S of range. Nest built by female, an oval, tapered domed structure with narrow bottleneck entrance, often made from green moss, bound with spider web or thin rootlets and lined with pale-coloured lichen, inner walls of fine bark fibre, thickly lined with soft silky plant down, fur, feathers or moss, often with a "tail" dangling below, suspended mostly 3–6 m above ground in tree, shrub, sapling or vines. Clutch 2–3 eggs; white to reddish-tinted with fine red to purplish spots, freckles and blotches, often forming band at large end; incubation possibly by both sexes, period 18–19 days; chicks fed by both parents, nestling period 14–16 days. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Longevity in ringing studies at least 6 years (11 months).

**Movements.** Largely resident; some local movements reported around Atherton Tableland (Queensland) and in SE Australia in non-breeding season.

**Status and Conservation.** Not globally threatened. Widespread and common in E Australia E of Great Dividing Range. This species' voice is a typical sound of the rainforests of E coast. Nests sometimes used by other species, e.g. two species of vespertilionid bat recorded as roosting in nests of this acanthizid.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Blakers *et al.* (1984), Christidis & Boles (1994), Hall (1974a), Higgins & Peter (2002), Keast & Recher (1997), McGill (1970), Meise (1931a), Morcombe (2003), Nielsen (1996), Parker *et al.* (1985), Pizzey *et al.* (2005), Schodde & Mason (1999), Schulz (1998), Serventy *et al.* (1982), Slater *et al.* (2003).

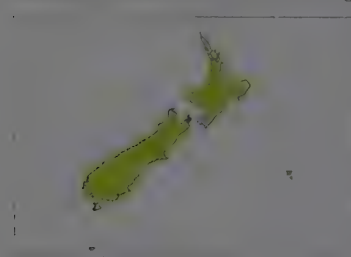
## 32. Grey Gerygone

### *Gerygone igata*

French: Gerygone de Nouvelle-Zélande German: Maorigerygone Spanish: Gerigón Maori  
Other common names: Grey (Gerygone) Warbler, New Zealand (Grey) Gerygone/Fairy-warbler

**Taxonomy.** *Curruca igata* Quoy and Gaimard, 1830, Tasman Bay, Cook Strait, New Zealand. Forms a superspecies with *G. mouki*, possibly including also *G. albofrontata* and, perhaps, *G. modesta*. With exception of *G. albofrontata*, these were once considered (together with the extinct Lord Howe I species *G. insularis*) to be conspecific, but they differ significantly in plumage and song.

**Distribution.** Forests of New Zealand, including Stewart I and adjacent offshore islands.



**Descriptive notes.** 10 cm; 6.5 g. Plumage is greyish-olive above, with blackish lores; tail with broad blackish subterminal band, large white spots near tips of all except central rectrices; grey face, chin, throat and breast, white rest of underparts, sometimes with pale yellow or grey tinge on flanks; iris dark red; bill and legs black. Sexes alike. Juvenile has paler face and breast, and pale eyering. Voice. Song, from perch or in flight (and when foraging), ventriloquial and far-carrying, with some very soft quiet components, basically a sweet, long and plaintive rambling trill sequence lasting for up to 12 seconds, seeming to have a

number of such themes which are sung repetitively, rather than woven into a song; only adult male gives a full song, for territorial or agonistic purposes, whereas female and young give subsong. Short trills and twitters commonly given, and a harsh chatter during chases or copulation; sharp but quiet bill-clicking in threat situations.

**Habitat.** Forest, woodland, secondary growth, farmland, parks and gardens, forest margins, shrublands, hedgerows and mangroves; found in both native vegetation and exotics such as pines (*Pinus* spp.), eucalypts (*Eucalyptus* spp.), *Acacia* pasture and open country, but inhabits vegetated gulleys. From coastal plains to mountain ranges, up to 1500 m in subalpine zone (but at much lower density there).

**Food and Feeding.** Primarily insects, also spiders (Araneae); sometimes small fruits and seeds such as fruit from *Diospyros* (*cordifolia*), *Pseudotsuga*, *Gracilaria littoralis* and *Wormmannia racemosa*; seen also to take cooked rice. Forages singly or in pairs, or in small groups of up to eight individuals. Forages from ground to upper canopy, depending on habitat; often in understorey or middle levels. Collects food items by gleaning from foliage, also by sally-hovering and picking from water level. Old report of bird catching steamers' geysers, seemingly unaffected by sulphur fumes, and catching minute flies (Diptera) attracted by the warmth. Outside breeding season often with mixed flocks, including those with Silvereyes (*Zosterops lateralis*), *Mohua* species, Tōmūtū (*Petroica macrocephala*), New Zealand Fantail (*Rhipidura fuliginosa*) and Yellow-fronted Parakeet (*Cyanoramphus auriceps*), as well as introduced Common Chaffinch (*Fringilla coelebs*) (Parker *et al.* 1985).

**Breeding.** Season mid-May to Jan, earlier (Sept) on South I and Stewart I; often double-brooded. Usually monogamous; nests solitary. Nest pear-shaped or bottle-shaped, side entrance closer to top than to bottom and sometimes with hood, made of rootlets and grass stems with moss, fur, fern, bark, also hair of wallaby bound by inner web, lining includes feathers, wool, downy seeds and tree-fence scales, sometimes a small dangling "tail", placed in tree or shrub, sometimes very often present but frequently attached laterally or from beneath; new nest built for each clutch. Clutch 3–4 eggs, occasionally 2 or 5, white to light pinkish, with reddish-brown spots (usually concentrated around large end), incubation apparently by female alone, mean incubation period 19.5 days, chicks brooded by female, fed by both sexes, nestling period 17–19 days; juveniles fed for up to 38 days after fledging. A major host of Shining Bronze-cuckoo (*Chrysococcyx*

*lucidus*), and some parasitized nests probably destroyed by the hosts. Significant nest predation by introduced mammals such as stoat (*Mustela erminea*) and black rat (*Rattus rattus*). Longevity in ringing studies at least 5 years 5 months.

**Movements.** Mostly resident, but some local wandering reported. Altitudinal migration on E coast of South I, and perhaps elsewhere, triggered by first cold weather or severe frosts of autumn; in Canterbury Region, substantial influx into cities and towns between Apr and Aug revealed by monthly monitoring at 30 sites at various altitudes from sea-level to 500 m in Christchurch area. Vagrant in Snares Is.

**Status and Conservation.** Not globally threatened. Generally common throughout and notably adaptable; one of the most successful endemic bird species in New Zealand. Has adapted to all mixed native-exotic and exotic wooded habitats throughout the country, and found in any rural or urban environment where clusters of trees are present. Occurs on most offshore islands; disappeared from Three Kings Is (off N North I), where was always scarce, by 1940s. For the Maori people, the start of singing by this species in spring formerly signalled the beginning of the crop-planting season.

**Bibliography.** Anderson & Ogden (2003), Bull *et al.* (1985), Cunningham & Moors (1985), Dean (1990), Gill (1978, 1982, 1983a, 1983b), Gill *et al.* (1983), Heather & Robertson (1997), Higgins & Peter (2002), Keast & Recher (1997), Meise (1931a), Onley (1980), Sibson (1958), Stidolph (1939), Turbott (1967), Wodzicki (1946).

## 33. Chatham Gerygone

### *Gerygone albofrontata*

French: Gerygone des Chatham German: Langschnabelgerygone Spanish: Gerigón de las Chatham

Other common names: Chatham Island Gerygone/Warbler, Chatham (Island) Flyeater

**Taxonomy.** *Gerygone? albofrontata* G. R. Gray, 1844, Chatham Islands.

Relationships uncertain. May constitute a well-differentiated member of the superspecies formed by *G. mouki* and *G. igata*, presumably following rapid evolution after colonization by a small founder population; alternatively, may not be a derivative of *G. igata* but, instead, the result of an earlier invasion by a gerygone that has since become extinct on the New Zealand mainland. Monotypic.

**Distribution.** Chatham Is, E of New Zealand.



**Descriptive notes.** 12 cm; male 11 g, female 9.5 g. Large, long-billed gerygone. Male has white forehead and supercilium, whitish face, narrow dark eyestripe, white broken eyering; crown and upperparts, including upperwing, olive-brown, tail grey-brown with dark sub-terminal band, large white spots on inner webs of all rectrices except central pair; whitish below, pale olive wash from flanks to vent; iris dark red; bill black, often pale grey base of lower mandible; legs greyish-brown or dark grey. Female is slightly smaller than male, differs in having white on forehead much reduced, supercilium and underparts duller and greyer.

Juvenile resembles female, but supercilium less distinct, dark eyestripe reduced to a patch in front of eye, broken eyering more prominent below eye and sometimes yellow-tinged, face and underparts sometimes washed yellow, iris dark brown (not red), bill dark brown with paler pinkish (not grey) base, legs dull pink. Voice. Song, serving territorial function and given only by male (mostly in breeding season), a rapid phrase of 4 or 5 notes, with second note much higher than first, also described as faint trill of 4 notes with pitch descending from first to second, maintained for second to third, then descending again from third to fourth; very distinct from those of *G. igata* and *G. mouki*. Weak trisyllabic notes, repeated several times, also noted.

**Habitat.** Inhabits dense native forest, thicket and shrubland, from coast to plateaux. Also occurs in cleared country overgrown with bracken (*Pteridium aquilinum*) and pohuehue (*Muehlenbeckia australis*).

**Food and Feeding.** Reportedly feeds on flies (Diptera), beetles (Coleoptera), moths and caterpillars (Lepidoptera), as well as spiders (Araneae). Forages singly, in pairs or, often, in small family groups, and may form flocks in non-breeding season; can be quite tame. Forages mainly in understorey of dense forest and coastal shrubland, spending much time on ground (rather atypical for the genus); dead wood and endemic plants seem to provide important feeding habitats. Gleans invertebrates from twigs and foliage, probes into crevices and searches in leaf litter; unlike many congeners, only seldom hover-gleans. Often associates with New Zealand Fantail (*Rhipidura fuliginosa*).

**Breeding.** Season Sept–Jan, varying from year to year according to conditions; usually single-brooded. Long chases interspersed with song bouts by male while female builds nest. Usually nest built by female alone, domed, with side entrance and arched roof projecting slightly above it, of roots, moss, twigs, lichen, leaves, bark, grass stems and feathers, bound with spider web, lined with feathers; suspended freely and in the open 1.5–10 m up in tree or shrub (main Chatham I), but on predator-free islands placed low down in dense vegetation, to which base and sides connected; some pairs defended same site over three seasons. Clutch 3 or 4 eggs, white, with reddish-brown speckles usually concentrated near large end; incubation by female, period 17–21 days (mean 19.5 days); chicks fed by both sexes, nestling period 19–23 days (mean 20 days); fledglings fed for up to 24 days after leaving nest.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Chatham Islands EBA. Locally common. Common on Mangere I and South East I, but vulnerable to any ecological changes there; has declined in N part of main Chatham I, where now rare, but still regular in S; only small numbers present on Pitt I, where formerly common. Recorded also from Houaouakopara and Little Mangere, and reported also from Star Keys. Recent population increases noted in S part of Chatham I, in areas where predator-control programmes have been implemented to assist conservation of endangered taxa such as Magenta Petrel (*Pterodroma magentae*) and Chatham race *chathamensis* of New Zealand Pigeon (*Hemiphaga novaeseelandiae*). As this gerygone is very tolerant of nest disturbance, it was used as surrogate host for the Black Robin (*Petroica traversi*) during initial stages of recovery programme for that endangered species. Should itself probably be regarded as Vulnerable because of its restricted range and evident declines on at least two islands.

**Bibliography.** Bull *et al.* (1985), Butler & Merton (1992), Chambers (1989), Dennison *et al.* (1984), Fleming (1939), Ford (1986), Heather & Robertson (1997), Higgins & Peter (2002), Keast & Recher (1997), Lindsay *et al.* (1959), Meise (1931a), O'Donnell & Dilks (1993), Robertson & Dennison (1984), Turbott (1967).



*Gerygone modesta*

**Taxonomy.** *Gerygone modesta* Pelzeln, 1860, Norfolk Island, in Tasman Sea. Relationships uncertain. May possibly belong in the superspecies formed by *G. mouki* and *G. igata*; all were once considered (together with the extinct Lord Howe I species *G. insularis*) to be conspecific, but they differ significantly in plumage and song. Possibly closer to *G. levigaster*—*G. fusca* group. Genetic studies required. Monotypic.

**Distribution.** Norfolk I (including vegetated N islets), E of Australia.

**Descriptive notes.** 9.5–12.3 cm; c. 7 g. Plumage is olive-brown above, with pale grey face, white broad eyering, small dark patch in front of eye; tail with broad blackish subterminal band, all rectrices except central pair with dark-edged white spots near tip, spots increasing in size outwards; chin, throat and breast pale grey, rest of underparts whitish, buff wash on flanks to undertail-coverts; axillaries white; iris reddish-brown to bright red; bill black; legs black to greyish-brown or brown, soles yellowish. Sexes alike. Juvenile has yellowish eyering, yellow wash on face and underparts, darker brownish iris and paler bill. **Voice.** Song a melodious

warbling, with ending slurred, similar in character to those of congeners, but ending less emphatically than song of *G. igata*.

**Habitat.** Inhabits rainforest, secondary growth, hedgerows, pastureland with remnant vegetation and gardens. Seems to avoid remnant Norfolk pines (*Araucaria heterophylla*) that are present in farmland.

**Food and Feeding.** Insectivorous. Forages mainly in canopy of trees and shrubs, darting about actively between bouts of hover-gleaning; also gleans insects from foliage, probes tree bark, and often feeds on ground. Tame and confiding.

**Breeding.** Recorded Nov-Feb; probably double-brooded. Nest pear-shaped, domed, with side entrance near top, made from bark, grass, moss, fibrous roots, spider webs, cow hair or wool, lined with feathers, suspended from slender branch on outer edge of canopy. Clutch 2-4 eggs, white to light pinkish with red streaks, blotches or spots; no information on duration of incubation and nestling periods; nestlings fed by both parents, fledglings fed for several weeks after leaving nest. Nests parasitized by Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Main nest predator is black rat (*Rattus rattus*).

**Movements.** Sedentary.

**Investments:** Security.

**Status and Conservation:** VULNERABLE. Restricted-range species: present in Norfolk Island IBA. Common. Estimated global population in excess of 3000 individuals. The most abundant native bird species, has adapted well to modified habitats on a small island that has feral cats and black rats (siting of nest in canopy probably helps to reduce predation by rats). Remaining stands of good-quality forest on the island are protected within Norfolk Island National Park. The species is absent from Nepean I and Philip I, off S coast of Norfolk I. One suggestion is to introduce present species to Lord Howe I, where native *G. insularis* is extinct; if successful, this could supply a security reserve population; eradication of rats from Lord Howe I would be desirable, even though present species survives on Norfolk I despite presence of rats.

**Bibliography.** Anon. (2006a), Butcher & Stattersfield (2004), Christian (2005), Garnett & Crowley (2000), Hermes (1985), Higgins & Peter (2002), Keast & Recher (1997), Mathews (1928), Meise (1931a), Schodde *et al.* (1983), Stattersfield & Capper (2000).

*Gerygone tenebrosa*

**French:** Gerygone blafarde    **German:** Braunrückengerygone    **Spanish:** Gerigón Sombrio  
**Other common names:** Dusky Fairy-warbler/Flyeater, Dusky (Gerygone) Warbler

**Taxonomy.** *Psuedogerygone tenebrosa* R. Hall, 1901, Fitzroy River, north Western Australia. Possibly a member of the "*G. fusca* group". Races weakly differentiated. Proposed race *whitlocki* (Exmouth Gulf E to Cape Keraudren) considered synonymous with *christophori*. Two subspecies recognized.

**Subspecies and Distribution.**

*G. t. tenebrosa* (R. Hall, 1901) - coastal SW Kimberley Division of Western Australia, from Yampi Peninsula (mouth of R Trent) S to La Grange.

*G.1. christophori* Mathews, 1912. Pilbara coast from Kamersham S to N Shark Bay (C'W Western Australia).

**Descriptive notes.** 10–12.5 cm; c. 7.5 g. A distinctive pale-eyed medium-sized gerygone. Nominative race has dark laral stripe to eye, whitish supercilium to just behind eye (supercilia usually joining narrowly above bill), obscure whitish broken eyering; top of head and upperparts, including upperwing, pale grey or olive-grey with light warmer brown wash, particularly on rump, pale-fringed remiges; tail grey-brown with indistinct dark subterminal bar, outer rectrices with small whitish spots near tips; throat and underparts pale grey or off-white, breast side and flanks with greyish wash; iris white or cream; bill and legs black.

**Sexes alike.** Juvenile has pale yellow wash on supercilium, eyering, face and neck side, and faint pale yellow tinge on underparts, iris light greyish or cream-coloured (slightly darker than adult), bill blackish-brown with yellow basal half, lower mandible. Race *chiracophus* is very like nominate, but has somewhat longer wing and tail, perhaps slightly less grey on head. Song a 'cheewee-cheewee-cheeweechee-chut-chee-cheewee' series more repetitive and less vigorous than that of *G. leucogaster*, like a simplified version of *G. magnirostris* song. Short twittering chattering calls often used by partners when feeding near each other.

**Habitat.** Mangrove woodlands and coastal thickets; attracted particularly to flowering mangroves. Alleged occurrence also in swamp-forest and along creeks and in rocky gorges requires verification.

**Food and Feeding.** Primarily insects, including lepidopterans, beetles (Coleoptera), bugs (Hemiptera), wasps (Hymenoptera) and flies (Diptera); spiders (Araneae), snails (Gastropoda) and crabs (Decapoda) also taken. Often singly or in pairs, but also in small parties up to five individuals. Arboreal, in dense mangroves; forages mainly in outer canopy, from leaves and flowers, also on trunks and branches and on prop-roots of mangroves.

**Breeding.** Poorly known. Recorded Sept–Jan, mainly in dry season. Nest a compact, tightly woven domed structure (much smaller than nest of *G. magnirostris*) with short slender 'tail', narrow hooded or spout-like side entrance near top, built from bark, dry seaweed, leaves and feathers, bound with spider webs and plant fibre, lined with feathers and soft plant material, suspended at c. 2.5–5 m from mangrove branches. Clutch 2 eggs, white or light pinkish, small reddish-brown spots or blotches mainly at larger end, where may form a cap; no information available on incubation and nestling periods; chicks fed by both parents. Longevity recorded in ringing studies more than 8 years 7 months.

**Movements.** Resident, but poorly known; records from offshore islands and isolated mangrove patches suggest that some purely local movement likely.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in West Australian Mangroves Secondary Area. Generally poorly known; seems fairly common in remote tropical and subtropical mangrove habitats of NW Western Australia.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Blakers *et al.* (1984), Christidis & Boles (1994), Collins (1995), Hall (1974a), Higgins & Peter (2002), Johnstone (1990), Keast & Recher (1997), McMill (1970), Meise (1931a), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003).

*Gerygone levigaster*

**French:** Gérygone des mangroves **German:** Mangrovegerygone **Spanish:** Gerigón de Manglar  
**Other common names:** Mangrove Warbler

**Taxonomy.** *Gerygone levigaster* Gould, 1843, Port Essington Coburg Peninsula, Northern Territory, Australia.

Probably forms a species group with *G. flavolateralis* and *G. fusca*, and in past sometimes treated as conspecific with latter; has been thought to be related to *G. sulphurea*; and was considered possibly conspecific with *G. inornata*. In past, sometimes considered to include extinct *G. insularis* (Lord Howe I) as a race. Three subspecies recognized.

### Subspecies and Distribution.

*G. l. pallida* Finsch, 1898 – coastal S New Guinea from Triton Bay and R Mimika E to Port Moresby region.

*G. l. levigaster* Gould, 1843 – N Western Australia (NW edge of Great Sandy Desert E to Roebuck Bay) E patchily along coast (including Groote Eylandt and Mornington I) to N Queensland (S to Princess Charlotte Bay, in NE Cape York Peninsula).

*G. l. cantator* (Weatherill, 1908) - coastal E Australia from NE Queensland (Cleveland Bay) S to Sydney region of New South Wales.

**Descriptive notes.** 9.5–11.5 cm; c. 6 g. Nomin ate race is grey-brown above, with distinct narrow dark lateral stripe, obvious white supercilium ending just behind eye, narrow white broken eyering (most obvious on lower half); tail distinctive, with broad blackish subterminal band, large white spots on inner webs of all except central rectrices, and indistinct diffuse white band across base of outermost 2–3 pairs; white below, upper flanks generally washed light grey-brown, lower flanks tinged creamy; iris red; bill black, sometimes grey base of lower mandible; legs black. Distinguished from *G. magirostris* most readily by

supercilium. Sexes alike. Juvenile is variably washed lemon-yellow on face, eyering, neck side, throat and breast, with yellow fringes on remiges, eye brown, bill brownish and fading to pale horn at base. Race *pallida* is browner above, lacks white at bases and near tips of outer webs of outer rectrices; *cantator* has marginally longer wing, tarsus and tail and is heavier than nominate, on average slightly darker above, slightly grey-tinged on chin to breast, generally less white at tail base (variable). VOICE. Song, throughout year (mostly in breeding season in far S of range), a sweet, rich, tuneful, rather ventriloquical sound, highly variable, some similar to *G. fusca* song but not so long, others (in W of range) very high-pitched whistled notes and slow descending warble. Quiet contact chatter often given.

**Habitat.** In Australia primarily mangroves; also adjacent forest, thicket and woodland, such as paperbarks (*Melaleuca*) in Kimberley, and woodlands along watercourses. May move out from mangroves to forage in nearby woodlands during breeding season, and was historically recorded in coastal parks and gardens in New South Wales. When sympatric with *G. magnirostris* tends to keep to shrubby landward side of mangroves; in Kimberley largely displaced from mangroves by *G. magnirostris* and *G. tenebrosa*, and occupying paperbarks and pindan wattle (*Acacia tumida*) scrub up to 20 km inland. In New Guinea occupies *Avicennia* mangroves, and may extend at times to floodplain-forest by creeks.

**Food and Feeding.** Recorded prey includes beetles (of families Chrysomelidae, Curculionidae), grasshoppers (Orthoptera), wasps (Hymenoptera), ants (Formicidae), moths (Lepidoptera) and scale insects (Coccoidea). Forages singly, in pairs and in small groups, often with mixed flocks of white-eyes (*Zosterops*), honeyeaters (Meliphagidae), *G. magnirostris* and *G. fusca*, and fantails (*Rhipidura*). Mainly in canopy, although feeds from ground upwards, often searching mud by mangrove roots. Hover-creeps and sallies, recorded as feeding on scale insects on citrus in gardens near Brisbane (St. Luciasland). Behaviour and acrobatics much as conifers, but perhaps, especially aerial, spending more time among foliage.

**Breeding.** Recorded in all months, but principally spring–summer in F. Australia and autumn–spring dry season in N. multi-occupied, and self-fertile after failure. Female believed to build, and seems to be sensitive to disturbance when building, nest a compact oval, domed, with spout-like hooded entrance at side near top, made from grass, roots, bark, dry seaweed and moss, bound with spider webs, lined with feathers and soft plant material, decorated on outside with spider webs, and egg sacs (occasionally other material, e.g. lichens), suspended from branch usually of mangrove, occasionally of other tree (e.g. paperbark), recorded as nesting near large wasp colonies.



Kimberley (Western Australia). Clutch 2–3 eggs, usually 3, pale pinkish to blue (rarely white), with faint red-brown flecks and spots (either over whole shell or forming cap or zone at large end; incubation period 14–17 days; chicks deserted by both adults; nesting period 14–17 days). Nests in Australia parasitized by *Attila (Attila) lineatus*, *minulidius*, *Shining (Chrysococcyx lucidus)* and *Horsfield (Horsfield) kingfisher (Horsfield)*.

**Movements.** Primarily resident, but some change in seasonal abundance is apparent in far S of range.

**Status and Conservation.** Not globally threatened. Uncommon in New Guinea, largely confined to mangroves in S, extending to isthmus at head of Greivink Bay in NW. Fairly common and widespread but rather patchily distributed in Australia. In E Australia, local loss of mangrove habitat has adversely affected populations, as in SE Queensland; has expanded S in New South Wales since 1940s.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Chisdom & Boles (1994), David & Gosselin (2002a), Hall (1974a), Higgins & Peter (2002), Keast & Recher (1997), McGill (1970), Meise (1931a), Moske (2001), Pizzey *et al.* (2005), Rand (1938), Schodde & Mason (1999), Schodde & Tideman (1990), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003).

## 37. Fan-tailed Gerygone

### *Gerygone flavolateralis*

French: Gerygone melanesienne

Spanish: Gerigón Melanesio

German: Flächerschwanzgerygone

**Other common names:** Fantail Gerygone/Warbler, Fan-tailed Fairy-warbler/Flyeater, Fan-tailed (Gerygone) Warbler, Yellow-sided Warbler

**Taxonomy.** *Acanthiza flavolateralis* G. R. Gray, 1859, New Caledonia.

Probably forms a species group with *G. levigaster* and *G. fusca*. Five subspecies recognized.

**Subspecies and Distribution.**

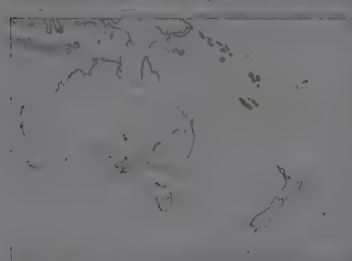
*G. f. citrina* Mayr, 1931 – Rennell, in SE Solomons.

*G. f. correni* Mayr, 1931 – Banks Is and S. Vanuatu.

*G. f. rufa* (F. Sarasin, 1913) – Ouvea, in N Loyalty Is.

*G. f. lifuensis* (F. Sarasin, 1913) – Lifou, in C Loyalty Is.

*G. f. flavolateralis* (G. R. Gray, 1859) – New Caledonia and S Loyalty Is (Mare).



**Descriptive notes.** 10 cm. Typical small, rather drab gerygone. Male is olive-brown above, head more olive-grey, with indistinct narrow whitish fore supercilium and thin broken eyering; upperwing and tail olive-brown, subterminal white spots on outer tail feathers; throat whitish-grey, flanks and belly lemon-yellow, rest of underparts pale greyish; iris red; bill black; legs black or dark grey. Female is paler than male. Juvenile has underparts entirely yellowish. Races differ slightly in coloration, extent and prominence of supercilium, and biometrics; *citrina* is greener above, whiter on throat, and brighter yellow on belly and flanks.

**Voice.** Sings at any time of day, less in hottest period. Quiet, thin, piping repetitive "tee poo" (tee-poo-tee-poo) series, also a descending squawky "tee poo-tee-poo-tee-poo" (tee-poo-tee-poo) series, in Vanuatu, race *correni* has a less piping, and more run-together series, "tough-tough-tough-tough" (tee-poo-tee-poo) on Rennell (*citrina*) most series are of just 4 notes. Constant soft, quiet twittering as contact when foraging.

**Habitat.** Forest and secondary growth, village gardens and scrub, from sea-level to hills; to at least 1000 m in Vanuatu.

**Food and Feeding.** Insectivorous; no details of prey items, but takes insect larvae and pupae, as well as moths (seen on N or in pairs or small family parties; joins mixed flocks with white-eyes (*Zosterops*), fantails (*Rhipidura*) and whistlers (*Pachycephala*). Forages from low levels up to canopy, mostly in middle stage (clears from forage, twigs and branches, may also hover and sally for prey).

**Breeding.** Season Sept–Jan/Feb in Vanuatu. Nest is a domed structure with a hooded side entrance (not a tunnel) and a "tail" beneath, constructed from plant fibres, rootlets, soft bark and moss, bound with spider webs, lined with feathers and soft plants, usually suspended from vine stems 1–5 m above ground. Clutch 2–3 eggs, white or buff, marked with brown; no information available on incubation and fledging periods. Nests parasitized by Shining Bronze-cuckoo (*Chrysococcyx lucidus*).

**Movements.** Resident, capable of short movement, as it has apparently colonized various islands in Vanuatu from time to time.

**Status and Conservation.** Not globally threatened. Restricted-range species present in Rennell and Bellona Is, Vanuatu and on the LBA and New Caledonia IBA. Quite common on most islands, but may be locally rare, so long as some trees are present. Has apparently disappeared from some islands and colonized others in Vanuatu, e.g. species was unknown on Erromango until 1961 and also on Mafo, but, conversely, may have disappeared from islands of Anson, Anson and Papeete (Gage, 1961). Mulukula, Perseus and Vanua Lava after 1926 (Whitney 1961). Also on Rennell, but not on the island of Rennell (Diamond & Muscivora).

**Bibliography.** Barrett *et al.* (2003), Chisdom & Boles (1994), Diamond & Muscivora (1976a, 1976b), Doughty *et al.* (1999), Dutton (2007c), Gregory (1999, 2002), Hadden (1981, 2004), Hannebert & Létocart (1980a, 1980b), Létocart (2001, 2004), Mayr & Diamond (2001), Meise (1931a), Totterman (2005), Watling (2001).

## 38. Western Gerygone

### *Gerygone fusca*

French: Gerygone à queue blanche

Spanish: Gerigón Coliblanco

German: Weißschwanzgerygone

**Other common names:** Western Fuscous Inland White-sided Warbler

**Taxonomy.** *Ptilopus fusca* Gould, 1838, Swan River, Western Australia.

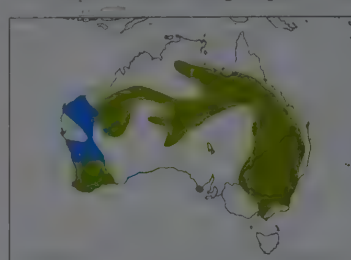
Probably forms a species group with *G. levigaster* and *G. flavolateralis*, and in past sometimes treated as a subspecies of *G. levigaster*. Races *maui* and *maui* intergrade in S Gulf of Carpentaria region; possible clinal variation within *exsul*, underparts becoming whiter and white markings increase from N to S, but complicated by *maui* race and *maui* forms into range of race *maui*. *maui* formerly included within nominate; three subspecies recognized.

**Subspecies and Distribution.**

*G. f. fusca* (Gould, 1838) – SW Western Australia S from about Leeman (and extending N in non-breeding season to Pilbara and S Kimberley Division); also South Australia (S Eyre Peninsula).

*G. f. mungi* Mathews, 1912 – inland WC Australia, within area roughly bounded by Pilbara and C Northern Territory (Barkly Tableland) in N, by Simpson Desert and W Queensland border in E and by NW South Australia and Wiluna region of Western Australia in S.

*G. f. exsul* Mathews, 1912 – inland C & E Australia from Queensland (base of Cape York peninsula and W slopes of Great Dividing Range) S to W basin of Murray–Darling and C Victoria.



**Descriptive notes.** 9–11.5 cm, 6 g. A plain brownish-grey gerygone with inconspicuous pale supercilium before eye. Nominative race is brownish-grey above, becoming warmer brown on rump; tail has broad blackish subterminal band, prominent white spots edged dark at tip, dark central rectrices, and white sides at tail base; white below, variable grey wash on throat and breast; iris red; bill black; legs dark grey to black. Sexes alike. Juvenile is washed yellowish on face, throat and breast, has brown to buff iris, pale base of lower mandible. Race *mungi* is paler than others, with least white in tail; *exsul* is intermediate between

previous and nominate. **Voice.** Song, mainly in breeding season, a sweet, plaintive high-pitched hesitant series of linked descending motifs that often tail off before starting again, described (lyrically) as "the echo of dwarf violins played in the moon"; similar to songs of *G. olivacea* and *G. levigaster* but fainter, seeming to hesitate and begin again several times.

**Habitat.** Dry eucalypt (*Eucalyptus*) and acacia (*Acacia*) woodlands to 850 m in subtropical, temperate, semi-arid and arid zones; avoids high-rainfall areas, but often found along watercourses.

**Food and Feeding.** Recorded food items include arachnids, beetles (Coleoptera), bugs (Hemiptera), lepidopteran larvae (Psyllidae), wasps and ants (Hymenoptera), and midges (Diptera). Arboreal, foraging mainly on outer foliage at 1–5 m, sometimes descending to ground; some aerial sallying. Joins mixed flocks with *Acanthiza* species, *Smicronis brevirostris*, Red-capped Robin (*Petroica goodenovi*) and Rufous Whistler (*Pachycephala rufiventris*).

**Breeding.** Season Aug–Mar, mostly Sept–Jan. Nest, often built by both sexes, an oval purse, with slightly hooded side entrance and short "tail", made of vegetable fibre and bark, bound with spider silk, lined with feathers and/or fine dry grass, suspended from small branch or fork usually in outer part of tree or sapling. Clutch 2 or 3 eggs, pinkish-white with small reddish or purplish-brown spots and blotches, especially at large end; incubation period 10–12 days; chicks fed by both parents, nestling period c. 10–13 days, sometimes up to 15 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Bush Cuckoo (*Cacomantis variolosus*), and Horsfield's (*Chrysococcyx basalis*) and Shining Bronze-cuckoos (*Chrysococcyx lucidus*). Longevity in ringing studies more than 5 years 3 months.

**Movements.** Mainly resident in many areas. In SW Western Australia, during non-breeding season some local movements towards N, involving at least part of the population. Likewise, in inland E Australia, some movements both in non-breeding season and during wet periods inland, leading to overlap in distribution of races *exsul* and *mungi*. Colonized Rottnest I (off Perth) from the mainland.

**Status and Conservation.** Not globally threatened. Fairly common in SW of range (nominate race); sparse elsewhere. Population in wheatbelt of Western Australia reduced by land clearance; similar decrease reported in Rockhampton area of E Queensland (race *exsul*), following removal of native vegetation.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Baker, M.C., Baker, M.S.A. & Baker (2003), Barrett *et al.* (2003), Chisdom, A.H. (1921), Chisdom, E.C. (1938), Ford (1981a, 1986, 1988), Hall (1974a), Higgins & Peter (2002), McGill (1970), Meise (1931a), North (1903), Pizzey *et al.* (2005), Reid *et al.* (1997), Saunders & Ingram (1995), Schodde & Mason (1999), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003).

## 39. Large-billed Gerygone

### *Gerygone magnirostris*

French: Gerygone à bec fort

German: Sumpfgerygone

Spanish: Gerigón Picudo

**Other common names:** Large-billed Fairy-warbler, Large-billed/Brown-breasted Flyeater

**Taxonomy.** *Gerygone magnirostris* Gould, 1843, Greenhill Island, Port Essington, Northern Territory, Australia.

Morphological characters suggest possibility of fairly close link to *G. dorsalis* and *G. chrysogaster*. Often considered conspecific with *G. hypoxantha*, but the two seem quite distinct. Geographical variation not well marked; some races possibly untenable. Proposed race *mimikae* (S New Guinea from Onin Bay E to Port Moresby) synonymized with *brunneipictus*. Eleven subspecies recognized.

**Subspecies and Distribution.**

*G. m. cobana* (Mathews, 1926) – West Papuan Is (Waigao I, Batanta I, Salawati I).

*G. m. oecasa* Ripley, 1957 – Kofiau I (WC West Papuan Is).

*G. m. conspicillata* (G. R. Gray, 1859) – NW New Guinea (Vogelkop region).

*G. m. affinis* A. B. Meyer, 1874 – N New Guinea (including islands of Yapen, Manam and Karkar).

*G. m. brunneipictus* (Sharpe, 1879) – S New Guinea and islands in N Torres Strait (Boigu, Saibai).

*G. m. proxima* Rothschild & E. J. O. Hartert, 1918 – D'Entrecasteaux Archipelago (Goodenough I, Ferguson I), off SE New Guinea.

*G. m. onerosa* E. J. O. Hartert, 1899 – Misima I (Lousiade Archipelago), SE of D'Entrecasteaux Group.

*G. m. tagulana* Rothschild & E. J. O. Hartert, 1918 – Tagula I (Lousiade Archipelago).

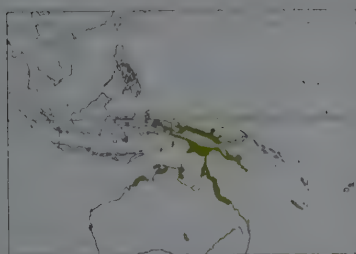
*G. m. rossellana* E. J. O. Hartert, 1899 – Rossell I (Lousiade Archipelago).

*G. m. cairnsensis* Mathews, 1912 – islands of S Torres Strait, and NE Australia (Cape York Peninsula S to Mitchell drainage in W and to Mackay in E).

*G. m. magnirostris* Gould, 1843 – coasts of N Western Australia (Napier-Broome Bay S to Collier Bay) and N Northern Territory (S to Daly R and Roper R), including Tiwi Is and Groote Eylandt.

**Descriptive notes.** 10–12 cm, c. 7 g. Similar in size and shape to *G. levigaster*, but with much broader and often longer bill. Nominative race has prominent pale broken eyering, variable white supralateral spot, dull olive-brown above, tail grey-brown, dusky subterminal tailband, indistinct (variable) off-white spots on tips of outer rectrices, whitish below, faint buffish-grey wash on breast side and flanks, stronger on rear flanks; iris red to orange-red; bill black, sometimes dark brown; legs black to flesh-grey. Sexes alike. Juvenile has faint lemon-yellow wash on eyering and chin to breast, less greyish-buff wash on side of chest, iris brown or grey-brown, bill brown or brownish-black, sometimes pale base of lower mandible. Races differ in biometrics and in tone of upperparts and extent and tone of buff on underparts: *cairnsensis* is very like nominate but





colder, more olive-brown, above, with larger and bolder tail spots, often richer buff below, and has both shorter wing and shorter bill; *brunneipectus* resembles previous, but supraloral spot less distinct, tail spots poorly defined and often restricted to outer two or three feather pairs; other races differ in minor details of size and plumage. Voice. Song varies with range, but basically a lilting, repetitive musical sequence typical of genus. In Australia, a long series of double notes followed by series of rapid triple descending phrases, or the whole sometimes rising and falling; in S New Guinea, a similar rapid rising and falling series of whistles.

Notes, some upslurred but mostly downslurs. Short trills and quiet single notes given on contact and as anxiety calls.

**Habitat.** Mangrove associations, also riparian and littoral woodland, paperbark (*Melaleuca*) woodland, rainforest and open sclerophyll eucalypt (*Eucalyptus*) woodland; confined to mangroves in N Western Australia, but occupies wider habitat range in Northern Territory, Queensland and New Guinea. In New Guinea found in mangrove formations, riparian scrub, bamboo near water, forest edges, and occasionally mango trees (*Mangifera*) in villages; usually seen near water. Sea-level to hills; in New Guinea to 270 m on Karkar I, and to 700 m on R Watut and 1200 m at R Baiyer (highlands in E).

**Food and Feeding.** Spiders (Araneae) significant prey; beetles (Coleoptera), bugs (Hemiptera), wasps (Hymenoptera), moths (Lepidoptera) and grasshoppers (Orthoptera) also taken. Forages singly, in pairs, or in small parties of 4–6 individuals, from canopy to ground level. Items obtained by gleaning from foliage, and by sallying to ground or hovering; prey taken also from flowers and mangrove roots.

**Breeding.** Recorded in all months. Solitary, but sometimes pairs close together (50 cm). Pair maintains territory. Nest built by both sexes, an untidy bulky-looking domed structure with long ragged "tail" and hooded side entrance, constructed from bark, plant fibre, dry grass, leaves, rootlets, vine tendrils, lichen, insect cocoons and spider egg sacs matted together, often bound with spider web, lined with feathers and plant down, fine bark or plant fibre; suspended from branch of low tree, shrub or vines, often quite low down and within reach over water (then resembling flood or tidal debris) or track, but may be up to 10 m above ground; often nests close to wasp nest. Clutch 2–3 eggs, pinkish-white, densely covered with red or purplish dots and freckles; incubation possibly by female alone, period 15–21 days; chicks fed by both parents, nestling period more than 13 days (one record). Nests in Australia parasitized by Pallid Cuckoo (*Cuculus pallidus*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*); in both Australia and New Guinea by Little Bronze-cuckoo (*Chrysococcyx minutillus*).

**Movements.** Primarily resident over most of range, but poorly known; suggestion of some local seasonal or food-related movements at some sites, as yet inadequately documented.

**Status and Conservation.** Not globally threatened. Common throughout most of range. Uncommon to scarce or rare locally, e.g. where mangroves have been destroyed and on some small Torres Strait islands. Race *brunneipectus* is listed as regionally "Near-threatened" in Australia, while still common in New Guinea.

**Bibliography.** Barrett *et al.* (2003), Beehler *et al.* (1986), Bell (1970b, 1982b, 1982d, 1983, 1984a, 1984c), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990), Frith & Frith (1995), Gyslenstolpe (1955b), Hall (1974a), Higgins & Peter (2002), Konst & Recher (1997), Mack & Wright (1996), Mayr & Rand (1937), McMill (1970), Meise (1931a), Nielsen (1996), North (1903), Officer (1961), Pizzey *et al.* (2005), Rand & Gilliard (1967), Rothschild & Hartert (1918), Schodde & Mason (1999), Schodde & Tideman (1990), Serventy *et al.* (1982), Slater *et al.* (2003), Stresemann & Pauidan (1932a), Wiencke (1988).

## 40. Biak Gerygone

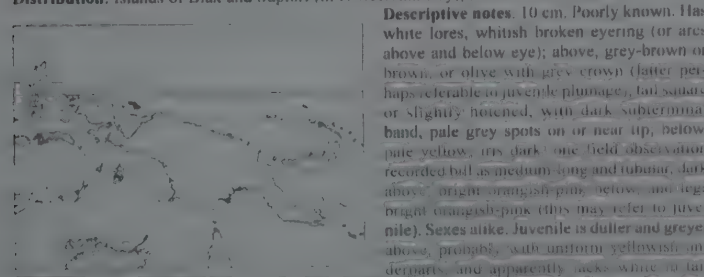
### *Gerygone hypoxantha*

**French:** Gerygone de Biak **German:** Biakgerygone **Spanish:** Gergón de la Biak  
**Other common names:** Salvadori's Gerygone

**Taxonomy.** *Gerygone hypoxantha* Salvadori, 1878, Misori (= Biak Island), Geelvink Bay, New Guinea.

Taxonomy unsettled; often regarded as a race of *G. magnirostris*, but seems quite distinct in having yellow in plumage, and confined to a long-isolated island with many other distinct endemic taxa. Reported occurrence on Biak of a gerygone (possibly female) similar to *G. palpehensis* needs to be evaluated, but this is probably the same as birds allegedly similar to *G. chrysogaster* but with long bill; both are thought likely to refer to present species. Monotypic.

**Distribution.** Islands of Biak and Supiori (in N Geelvink Bay), in NW New Guinea.



**Descriptive notes.** 10 cm. Poorly known. Has white lores, whitish broken eyering (or arcs above and below eye); above, grey-brown or brown, or olive with grey crown (latter perhaps referable to juvenile plumage), tail satiate or slightly notched, with dark subterminal band, pale grey spots on or near tip, below, pure yellow; iris dark; one field observation recorded bill as medium-long and tubular, dark above, bright orangish-pink below, no legs bright orangish-pink (this may refer to juvenile). Sexes alike. Juvenile is duller and greyer above, purplish, with uniform yellowish underparts, and apparently lacks white tail feathers. Voice. Almost unknown. A short song, strophic heard on one occasion in 2006 was reminiscent of *G. palpehensis* song, but not at same pitch; one song fragment recorded in 1995 sounds like a slow, perhaps more metallic *G. magnirostris*-type song. One call noted as "chuk, chuk, cheep", but very song-like.

**Habitat.** Lowland forest and woodland, including forest edge and secondary growth. Many of the known sightings have been from roadside forest.

**Food and Feeding.** Poorly known. Insectivorous, but no details available. Found singly or in presumed pairs, sometimes, in feeding, flock with Biak Flycatcher (*Micropodops*), similar-looking *M. atricapilla*, Dusky Hornbill (*Eucerynus*), and Spangled Drongie (*Phylloscopus*). Forages actively among foliage, from middle stratum to high up in canopy of forest, at 5–10 m.

**Breeding.** No information.

**Movements.** Resident.

**Status and Conservation.** ENDANGERED. Restricted-range species, present in Geelvink Islands IBA. BirdLife International has recently opted to downgrade this form to subspecies in its conservation listings. An almost unknown taxon. Appears to be rare and unobtrusive. Very few recent observations: three records from Wanati (I. Biak) during 1991–1994, two sightings in I. Biak Sept–Oct 1995, and one from Biak Utara Reserve in 1997, one or two sightings daily on several dates in Jan–Jul 2006. In view of extensive deforestation that has occurred here, and the continuing degradation and lack of effective set-aside means, the placement of this form in the Endangered category is likely to be fully justified. Known to occur in one set-aside area on Biak (at Biak Utara). Some good quality forest still remains on Supiori, and the gerygone has been reported twice from near the village of Surendewi, and also seen in a patch of forest near Wari village; if this is a lowland, forest special list, however, much of Supiori may be too high for it. Taxonomic status requires clarification.

**Bibliography.** Anon (2006a), van Hater (2006), van Hater (2007), Hutabai & Stattersfield (2004), Coates (1990), Collier *et al.* (2001), Ford (1986), Gregory (2007), Hutabai (2006), Hutabai *et al.* (2006), Mayr & Mayr de Staubeck (1939a), Meise (1931a), Stattersfield & Capper (2000), Webster (2007).

## 41. Golden-bellied Gerygone

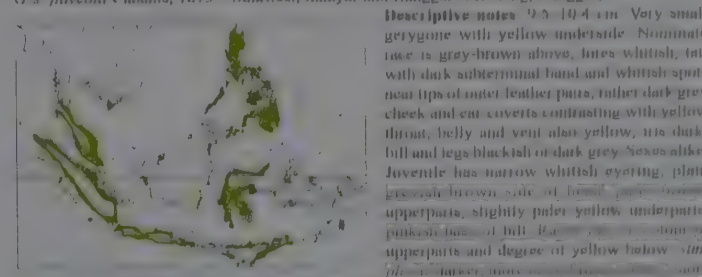
### *Gerygone sulphurea*

**French:** Gerygone soufrée **German:** Goldbrustgerygone **Spanish:** Gergón Sulphuro  
**Other common names:** Flycatcher, Golden-bellied/Yellow-breasted Flycatcher, Golden-bellied Fairy warbler, Yellow-breasted (Gerygone) Warbler, Yellow-breasted Wren-warbler

**Taxonomy.** *Gerygone sulphurea* Wallace, 1864, Solor Island, Lesser Sunda Islands. Possibly related to *G. leucogaster* or *G. inornata*. Races exhibit marked vocal differences as well as some plumage distinctions, suggesting that more than one species may be involved. Philippine birds seeming fairly distinct; further research, including molecular-genetic analysis, required. Five subspecies currently recognized.

**Subspecies and Distribution.**

*G. s. sulphurea* Wallace, 1864 – Malay Peninsula, Cochinchina and Greater and Lesser Sunda  
*G. s. muscivora* Oberholser, 1912 – Iragano I (off S Sumatra)  
*G. s. simplex* Cabanis, 1872 – N, W & C Philippines (Luzon, Lubang, Verde, Mindoro, Marinduque, Catanduanes, Tablas, Negros, Cebu, Olango, Bohol, Siquijor, Samar, Palawan)  
*G. s. rhizophorae* Mearns, 1905 – S Philippines (Mindanao, Basilan, and Sulu Archipelago)  
*G. s. flavida* Cabanis, 1873 – Sulawesi, Selayar and Banggai Is (Peleng, Banggai)



**Descriptive notes.** 9.5–10.4 cm. Very small gerygone with yellow underside. Nominative race is grey-brown above, lores whitish, tail with dark subterminal band and whitish spots near tips of outer feather pairs; rather dark grey cheek and ear coverts contrasting with yellow throat, belly and vent also yellow, iris dark, bill and legs blackish or dark grey. Sexes alike. Juvenile has narrow whitish eyering, plain greyish brown side of head, pale orange upperparts, slightly paler yellow underparts, pinkish base of bill. Race *simplex* has more of upperparts and degree of yellow below. *rhizophorae* darker, more olive-brown above, more obvious dark subterminal band, pale yellow of underside fading to whitish on belly and vent, *rhizophorae* lacks white loreal spot; *flavida* darker below than nominate, with less white in tail.

**Voice.** Song, given even during heat of day, differs markedly geographically. Nominative race in SE Asia sings up to 10 high-pitched, musical, glissading rising or falling whistles "zyew, zutit" and variants, whereas same race in Java has descending wheezy phrase of 3–5 notes, repeated many times. In NE Sulawesi (race *flavida*) has this descending phrase continuing to falling, repeated and repeated many times (in mountains and lowlands), or an oft-repeated weakly whistled similar descending cadence of c. 6 notes (in Palu lowland area). In Philippines up to 12 loud slurred wheezy "ohizz" notes alternating in pitch, phrase lasting up to 7 seconds and repeated several times per minute, ventiloquial and hard to locate. Rising "chee-wee" call.

**Habitat.** Wooded habitats, including montane forests, mangroves and tree-lined urban streets, also in swamp-forest, secondary growth and plantations, especially rubber, in SE Asia. From sea level to mountains, to 2300 m in Sulawesi and 1300 m in Flores.

**Food and Feeding.** Poorly known. Largely insectivorous. Gleans from foliage of tree crowns and middle storey, often from undersides of leaves; makes brief sallies to catch disturbed prey, also recorded stealing food from spider's web. Joins mixed-species flocks.

**Breeding.** Season Dec–Oct in SE Asia; recorded Apr–Jun in Philippines, but singing occurs from Jan–Jun and season may be longer than reported. Nest purse-shaped, with side entrance near top, suspended from branch of tree. Clutch 2–3 eggs, whitish, with whitish bases and spots, concentrated at large end, incubation period not known; fledging 14–15 days, both parents attend chicks and fledglings. Nests parasitized by Little Bronze-cuckoo (*Chrysococcyx minutillus*).

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Widespread and often common, it encompasses one song or call often the last heard as pressure of land, forest, and human activity increases. It may have had adverse effects on this species. In SE Asia, it is common in primary forest and protected areas. The species is apparently absent from Luzon and Sumatra (in W Java, Sumatra, two localities only).

**Bibliography.** Coates & Bishop (1993), Dickinson *et al.* (1999), Ford (1986), Gregory (2007), Hutabai & Stattersfield (2004), Hutabai *et al.* (2006), Mayr & Mayr de Staubeck (1939a), Meise (1931a), Stattersfield & Capper (2000), Webster (2007).

## 42. Plain Gerygone

### *Gerygone inornata*

**French:** Gerygone lisse **German:** Plaingerygone **Spanish:** Gergón Liso  
**Other common names:** Plain Fairy-warbler, Plain Warbler, Plain Gerygone, Plain Warbler

**Taxonomy.** *Gerygone inornata* Wallace, 1864, Solor Island, Lesser Sunda Islands. Possibly related to *G. leucogaster* or *G. inornata*. Also has a name in the Philippines, but comparison with *G. magnirostris* on Philippine islands is uncertain.



**Distribution** Savu, Roti, Timor and Wetar in E Lesser Sunda.



**Descriptive notes** c. 10 cm. A very small gerygone, with pale eyes, a thin line with dark spots and a dusky breast. Plumage is greyish-brown above, with dark lores, narrow white supercilial streak to mid-eye, and dark brownish ear-coverts, tail blackish with pale outer tip, white below, iris yellow, white or orange, bill dark grey, legs grey. Sexes alike. Juvenile is washed pale yellow below. Voice: Song is constantly repeated in a series, descending, or descending, or descending, or descending, or descending, "poo-pii, pee-pee, po-po, po-pu", duration c. 4 seconds, and described as structurally similar to a rapid peal of church bells; may sing almost continuously for as long as 10 minutes. Short "poo-poo" call also noted.

**Habitat** Primary and secondary monsoon forest, woodland, scrub and mangroves, from sea-level to 2500 m in W. Timor.

**Food and Feeding** Primarily insectivorous. Seen singly, in pairs or in small groups, readily perched and feeding. Gleans from foliage in middle storey and lower canopy. Often in mixed flocks with Arafura Fantail (*Rhipidura dryas*), Fawn-breasted Whistler (*Pachycephala pectoratus*) and Streak-breasted Honeyeater (*Meliphaga reticulata*).

**Breeding** No information. Likely to be parasitized by Little Bronze-cuckoo (*Chrysococcyx minutillus*) on Timor and Wetar, but as yet unproven.

**Movements** Resident.

**Status and Conservation** Not globally threatened. Restricted-range species, present in Timor and Wetar IBA. Widespread and common in all wooded habitats on Timor; common on Wetar. Subject to local loss of habitat as a result of clearance and degradation; possibly also due to fires during dry season.

**Bibliography** Coates & Bishop (1997), Finsch (1898), Mayr (1944b), Meise (1929, 1931a), Sharpe (1879a), Strange (2001), White & Bruce (1986).

### 43. Brown-breasted Gerygone

#### *Gerygone ruficollis*

**French** Gerygone à cou brun **German** Baumfarngerygone **Spanish** Gerigón Pechipardo  
**Other common names** Brown-breasted Warbler, Rufous-breasted Gerygone/Warbler, Treelet, Fairy-warbler/Flyeater/Gerygone/Warbler, De Vis's Tree-warbler

**Taxonomy** *Gerygone? ruficollis* Salvadori, 1876, Hatam, Arfak Mountains, Vogelkop, New Guinea. Two subspecies recognized.

**Geography and Distribution**

*G. r. ruficollis* Salvadori, 1876 – NW New Guinea (Arfak Mts).

*G. r. insperata* De Vis, 1892 – C mountain ranges of New Guinea I: to Owen Stanley Range, including Huon Peninsula.



**Descriptive notes** 9–10 cm. Has crown, side of head and upperparts brown, narrow whitish eyering; upperwing blackish, pale edgings on secondary and tertiary feathers; throat and underparts white, variable rusty buff or buffy-brown wash on side of breast, often forming diffuse band across breast; iris red-brown to dark brown, bill and legs black. Reads distinguished from *G. cinerea* by brownish coloration. Sexes alike. Juvenile has back more brown with olive tinge, becoming dingy on head, pale yellow, underparts, paler on belly. Races differ only in minor details of coloration.

**Voice** Song very evocative and distinctive, a delightful high-pitched, mournful, slow, unevenly descending series, levelling out at deeper pitch, often repeated; given, along with quiet twittering contact notes, while bird is foraging.

**Habitat** Primary forest, forest edges, gardens, secondary growth, casuarinas (*Casuarina*) in cultivated areas, towns and villages, also tree-ferns in subalpine grasslands. From 1100 m upwards, to 2500 m in W. Timor, common in all forest and middle levels.

**Food and Feeding** Insectivorous, but no details available. Forages singly, in pairs or in small groups, in middle storey, but will ascend to canopy of tall trees, also sometimes quite low down, particularly favours casuarinas. Gleans from leaves, also uses hovering flycatcher-like technique. Feeds with Western Mountain White-eyes (*Zosterops lateralis*).

**Breeding** Breeds in all seasons, both wet and dry seasons, nest seen in Oct, nest-building in Dec, food-carrying adults in Jan, and juveniles seen in Jun and Aug. Sings during nest-building; one parent feeds young in nest. Side entrance, decorated with lichens, suspended at 7 m. No other information.

**Movements** Resident. In some areas movements in response to drought; became very scarce around Ambau in severe drought of 1997 (when many trees died), but recovered quickly.

**Status and Conservation** Not globally threatened. Common in the monsoon region, occurring over huge area of remote and inaccessible habitat in New Guinea. Distinctive song often the first indication of its presence.

**Bibliography** Coates & Bishop (1997), Finsch (1898), Meise (1929, 1931a), Rand & Gillard (1967), Sime (1956), Junge (1953), Keast & Recher (1997), Mayr & Rand (1937), Meise (1931a), Rand & Gillard (1967), Sime (1956).

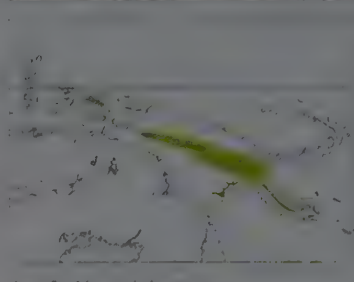
### 44. Mountain Gerygone

#### *Gerygone cinerea*

**French** Gerygone à dos gris **German** Weißbrotgerygone **Spanish** Gerigón Gris  
**Other common names** Mountain Gerygone, Mountain Warbler, Grey Gerygone, Grey Tree-warbler, Warbler, Mountain Warbler, Grey Gerygone, Grey Tree-warbler

**Taxonomy** *Gerygone cinerea* Salvadori, 1876, Hatam, Arfak Mountains, Vogelkop, New Guinea. Monotypic.

**Distribution** Vogelkop (Arfak Mts) and C. I. & S. mountain ranges of New Guinea.



**Descriptive notes** 9 cm. A small grey and white gerygone. Plumage is ashy grey above, slightly darker on upperwing, and tail has indistinct blackish subterminal band; clean white below, faint grey wash on chest and flanks, iris dark brown, bill dark greyish, legs grey. Distinguished from *G. ruficollis* by being much greyer above and whiter below, and lacking white tail spots. Sexes alike. Juvenile is much darker, but base of lower mandible yellow. Voice: Song is pleasing, slow, thin, descending series, very similar to that of *G. ruficollis*; also gives high-pitched "tee tee tee" or "tee ta tee", and scolding "zznt zznt" like

that of a *Myzomela* honeyeater.

**Habitat** Upper montane forest and forest edge, mostly from 2000 m to tree-line, at c. 2800 m, sometimes descends to 1600 m and, rarely, as low as 1000 m.

**Food and Feeding** Insectivorous, but no details known. Frequently found in small parties of 2–10 individuals with scrubwrens (*Sericornis*) and friendly Fantail (*Rhipidura albatunata*). Feeds actively in middle stratum to canopy, gleaning from leaves, twigs and branches; frequently hovers and dangles to grab insects, and may descend quite low along forest edge at times. Occupies similar niche to that exploited by *Tenninoria murina*, with which sometimes overlaps, but generally found at lower altitude than that species.

**Breeding** No information.

**Movements** Resident, some wandering to lower levels at times, but no regular movement reported.

**Status and Conservation** Not globally threatened. Fairly common in higher mountains, but distribution patchy, not so common as *G. ruficollis*. As much of this species' habitat lies in remote and inaccessible areas, its conservation is not of immediate concern.

**Bibliography** Beccari *et al.* (1986), Coates (1990), Coates & Dockrill (2001), Gillard & LeCros (1961a, 1968), Gyllenstein (1955b), Hartert (1930), Hartert *et al.* (1930), Keast & Recher (1997), Mayr & Rand (1937), Meise (1931a), Rand & Gillard (1967).

### 45. Green-backed Gerygone

#### *Gerygone chloronota*

**French** Gerygone à dos vert **German** Grünrückengerygone **Spanish** Gerigón Dorsiverde  
**Other common names** Grey-headed Gerygone, Green-backed Fairy-warbler/Flyeater/Warbler

**Taxonomy** *Gerygone chloronota* Gould, 1843, Port Essington, Northern Territory, Australia. Race *darwinii* possibly intergrades with nominate. Species name is a latinized Greek adjective and therefore must agree with feminine gender of genus, *chloronota*. Four subspecies recognized.

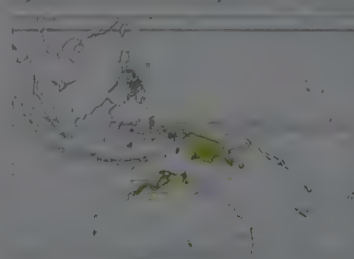
**Subspecies and Distribution**

*G. c. cinereiceps* (Sharpe, 1886) – hills and lowlands of mainland New Guinea, and W. Papuan Is.

*G. c. aruensis* Böttke, 1893 – Aru Is.

*G. c. chloronota* Gould, 1843 – N. Northern Territory (Arnhem L. and S. to lower Victoria and Roper river drainages), including Tiwi Is and Groote Eylandt, in N. Australia.

*G. c. darwini* Mathews, 1912 – N. Western Australia (from King Sound E. to Cambridge Gulf) and adjacent W. Northern Territory (E. to Victoria R.).



**Descriptive notes** 9.5–11 cm, c. 6.5 g (Australian races); 7.5–8.3 cm (New Guinea races). Small gerygone with distinctive greyish head, no tail spots. Nominative race has top and side of head and neck greyish, upperparts dark greenish-olive; upperwing and tail browner, tail with faint dark subterminal band; chin, throat and underparts white, variable brownish or greyish wash on breast side, variable pale yellow wash on flanks to underwing-coverts; iris red, bill black or blackish-brown, legs black to dark grey. Sexes alike. Juvenile similar to adult, but with diffuse off-white facial area, off-white broken eyering, upperparts duller and

less green. Races differ in minor details of head coloration and yellow tone of underparts. *darwinii* has paler head than nominate, and more buff and yellow below; New Guinea races are smaller. Voice: Song a rapid, thin musical "choopi choopi choopi" on rising scale, repeated continuously, and a monotonous repetitive flat series continued for quite long periods when excited. In New Guinea, race *cinereiceps* has rather higher-pitched ascending trilling series of similar structure, each song lasting c. 20 seconds, and often repeated. Dry, quick chirp notes, similar to contact calls of some congeners, also given.

**Habitat** In Australia, mainly riparian and monsoon vine forests and thickets, also mangroves and relict forest around sandstone outcrops, gorges and gulleys, and ecotone between mangroves and paperbark (*Melaleuca*) forest, sometimes in dry open eucalypt (*Eucalyptus*) woodland adjacent to other habitats. In New Guinea, frequents forest, gardens and secondary growth, from lowlands to c. 1500 m; mainly in hill forest, but also in monsoon and riparian forest in Trans-Fly lowlands.

**Food and Feeding** Prey includes spiders (Araneae), cockroach egg sacs (Blattodea), beetle (Coleoptera), bugs (Hemiptera), wasps (Hymenoptera) and lepidopteran larvae. Usually seen in presumed pairs or small family groups, sometimes singly; unobtrusive, seldom joins mixed feeding flocks. Forages at all heights, most often in middle to upper levels; has a liking for tall casuarinas (*Casuarina*) in SE New Guinea. Main method is gleaning among foliage, and also hangs upside-down to feed, dangles to catch prey, and flutter-chase, occasionally descending prey.

**Breeding** Little known. Recorded in Mar. (yet in Australia). Nest built by both sexes, a compact oval dome with short "tail" side entrance near top reported; extended into short "spout" midline of soft bark and grass and fine rootlets, thickly lined with plant fibres, plant down or feather, often decorated on outside with spider egg sacs or beetles, suspended from branch or creeper. 1.8–0.9 m above ground, often close to wisp nest and near water. Clutch 2–3 eggs, white, finely spotted red-brown, marked with band at larger end; incubation probably 12–14 days; from hatching to end of duration of incubation and fledging periods. Nests parasitized by Little Bronze-cuckoo (*Chrysococcyx minutillus*).

**Movements** Resident.



**Status and Conservation.** Not globally threatened. Fairly common but unobtrusive; easily missed if not singing. Common, but patchily distributed, in New Guinea. Local in Australia.  
**Bibliography.** Barrett *et al.* (2003), Beecher *et al.* (1986), Bell (1984a), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990), Coates & Peckover (2001), David & Gosselin (2002a), Frith & Frith (1995), Gilliard & LeCroy (1961a), Goodfellow (2001), Gregory (1995a), Hall (1974a), Hartert (1940), Higgins & Peter (2002), Keesen-Recher (1997), Mack & Wright (1996), May & Rand (1937), McGill (1970), Meise (1931a), Pizzey *et al.* (2005), Rand & Gilliard (1967), Schodde & Mason (1999), Schodde & Tideman (1990), Serventy *et al.* (1982), Slater *et al.* (2003), Stresemann & Paludan (1932a).

## 46. Fairy Gerygone

### *Gerygone palpebrosa*

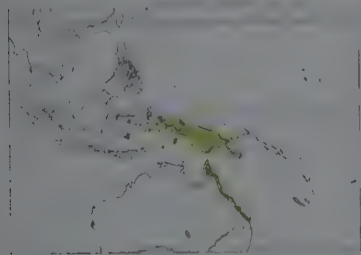
**French:** Gerygone enchanteresse **German:** Elfengerygone **Spanish:** Gorigón Duende  
**Other common names:** Fairy Warbler, Fairy/Masked/Yellow Flyeater, Masked/Yellow Gerygone; Black-headed Fairy-warbler/Flyeater, Black-headed Gerygone/Gerygone Warbler (*palpebrosa*); Black-throated Flyeater/Gerygone/Warbler (*personata*)

**Taxonomy.** *Gerygone palpebrosa* Wallace, 1865, Aru Islands. Sometimes thought that New Guinea races represent one species and Australian *personata* and *flavida* two further species, but last two intergrade in NE Queensland (from about Cooktown S to Townsville). Six subspecies recognized.

#### Subspecies and Distribution.

*G. p. palpebrosa* Wallace, 1865 – W New Guinea (including West Papua Is) and Aru Is.  
*G. p. wahnesi* (A. B. Meyer, 1899) – Yapen I and N New Guinea.  
*G. p. tarura* Rand, 1941 – S New Guinea from R Morehead I to R Fly.  
*G. p. inconspicua* E. P. Ramsay, 1878 – SE New Guinea I from upper R Fly.  
*G. p. personata* Gould, 1866 – NE Queensland (Cape York Peninsula S to R Mitchell and Townsville area), in NE Australia.  
*G. p. flavida* E. P. Ramsay, 1877 – coastal C Queensland from about Cooktown S to Gin Gin.

**Descriptive notes.** 10–11.5 cm; 8 g. Medium-small gerygone with distinctive male plumages. Male nominate race has forehead, side of head and throat to upper breast black, crown and nape olive, prominent white loreal spot and conspicuous white malar patch; upperparts dull olive to greenish-grey, upperwing and tail brown; underparts yellow; iris bright red or orange-red; bill black; legs slate-grey to black. Female lacks dark head markings, has pale eyering, white throat and yellow breast. Juvenile is like female but with entirely yellow underparts, dark brownish iris and paler brownish bill. Races differ mainly in darkness



of head and breast coloration of male: *wahnesi* has crown, nape and side of head black; *inconspicua* is like previous, but has crown and nape olive, upperparts duller and darker than in nominate, *tarura* like previous, but has black areas of head to upper breast tinged brownish; *personata* has crown and side of head dark olive, clear dusky or blackish bill; *flavida* is distinctive, male more like female, lacks dark head pattern, has fainter facial markings, greyish-yellow to pale yellow throat, upperparts brighter than previous. Voice. Often located by quiet but insistent, rather nasal "ti ti" contact note. Song, by male only, at any time of year (most often in Sept-Nov around Kuranda, in Australia), a loud, musical repetitive "wee-chee-choo-too-chee-choo-wee" series, interrupted by quiet chatters and warbles, and often given during aerial chases; seems to serve as both contact call and territorial advertisement. Subsong a quiet continuous chattering, warbling sequence interspersed with "ti ti" notes. One song of race *inconspicua* at Varirata (in SE New Guinea) is similar to a song of White-faced Robin (*Troglodytes leucops*). Males in New Guinea may have three different song patterns, which may be given in sequence, one pattern first, then another, then a third. Race *wahnesi* song (Adelbert Mts) described as "wididoplophidu", a rising and falling sequence of 4 whistled notes followed by disyllabic slur, similar to those in Queensland (*personata*), songs around Port Moresby include undulating and repeated reel of 10 notes (first 8 short and fast, last 2 loud and upslurred), or pattern of 5 whistled notes followed by "tutu-wheel-tu-wheel" (2 short notes followed by upslur, single note and then another upslur).

**Habitat.** Edges of tropical rainforest and ecotone between that and other habitats, vine thickets (e.g. at 40 Mile Scrub, in Queensland), and dense riparian habitats, from coast to hilly lowland and especially hill forest, locally to c. 1460 m, in New Guinea; often along tracks, and also on small offshore forested islets such as Bird I, off Madang (NE New Guinea).

**Food and Feeding.** Insectivorous, no details of items. Seen mostly singly, in pairs or in small parties of up to five individuals, probably family groups. Active and arboreal, foraging in foliage of trees, vines and shrubs from canopy down to near ground, most often in middle to upper levels. Most insects taken from leaves and bark, but also by sallying; frequently mutual chasing (perhaps associated with display). A core member of mixed-species flocks, in New Guinea joins flocks with Chestnut-bellied Fantail (*Rhipidura lyre-thyris*), Northern Lark (*Rhipidura rufiventris*), Monarcha monarch-flycatchers, Wallace's Wren (*Siphonotus wallacii*), Spangled Drongo (*Dicrurus hottentottus*), Monarch Flycatcher (*Ptilinopus diadematus*) and *G. chrysops*, recorded in Australia with Lovely Fairy-wren (*Malurus amabilis*), Sericornis beccarii and Sericornis magnirostris, monarch-flycatchers (*Monarcha arses*, *Myiagra*), Grey Rhipidura albicapa and Rufous Fantails (*Rhipidura rufirostris*), Pale-yellow Robin (*Troglodytes capito*), Yellow-breasted Boatbill (*Macraerophneustes flaviventris*), Little Strike Thrush (*Chamaea fasciata*), Grey Whistler (*Pachycephala pinnatifida*), Yellow White-eye (*Zosterops lateralis*), Silvereye (*Zosterops lateralis*) and Victoria's Riflebird (*Ptiloris pectoralis*).

**Breeding.** Birds in breeding condition in Oct (at end of dry season) in New Guinea; breeding recorded in Jul-May in Australia. Nest reported as built sometimes by both sexes, or by female alone, an elongated dome, with bottleneck-like entrance near top protected by projecting hood, made of palm fibre, bark, plant fibre, spider egg sacs, spider webs, cocoons, lichen and moss, with dry excreta of wood-boring insects incorporated in "tail" beneath, lined with soft seed down or other soft plant material, suspended from slender branch in outer foliage of tree or shrub or in low vines (*Calamita*) sometimes near water, in Australia often close to wasp (Hymenoptera)

nest (presumably for some protective advantage); likely to be site-faithful. Clutch 1–3 eggs, usually 2, white or faintly pinkish, finely freckled purplish-red, mainly in band around larger end; incubation probably by female only, chicks evidently fed by both sexes, those of nominate race reported as having erectile head plumes which can be quivered rapidly, perhaps serving an antipredator function; no information on duration of incubation and fledging periods. Nests parasitized by Shining (*Chrysomitris lucida*) and Little Bronze-cuckoos (*Chrysomitris minutifrons*).

**Movements.** Resident; wanderers have reached Magnetic I, off Townsville (Queensland).

**Status and Conservation.** Not globally threatened. Common in suitable habitat in all parts of range.

**Bibliography.** Barrett *et al.* (2003), Beecher *et al.* (1986), Bell (1982b, 1982d, 1983, 1984a), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990), Ford (1978a), Frith & Frith (1995), Gilliard & LeCroy (1961a), Gregory (1995a), Hall (1974a), Hartert (1940), Higgins & Peter (2002), Keesen-Recher (1997), Mack & Wright (1996), May & Rand (1937), McGill (1970), Meise (1931a), Nielsen (1996), North (1903), Officer (1961), Pizzey *et al.* (2005), Rand & Gilliard (1967), Schodde & Mason (1999), Schodde & Tideman (1990), Serventy *et al.* (1982), Slater *et al.* (2003), Stresemann & Paludan (1932a, 1932b), Wieneke (1988).

## 47. White-throated Gerygone

### *Gerygone olivacea*

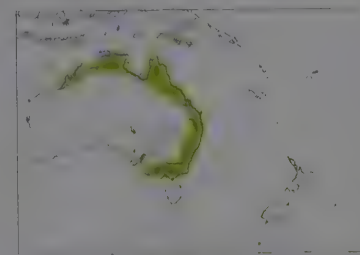
**French:** Gerygone à gorge blanche **German:** Weißkehlgergerygone **Spanish:** Gorigón Gorjiblanco  
**Other common names:** White-throated Warbler/Fairy-warbler, White-throated Flyeater

**Taxonomy.** *Psilopus olivaceus* Gould, 1838, New South Wales, Australia.

Three subspecies recognized

#### Subspecies and Distribution.

*G. o. cinerascens* Sharpe, 1878 – SE New Guinea (around Port Moresby area and gulf coast), and NE Australia (N & C Cape York Peninsula).  
*G. o. rogersi* Mathews, 1911 – N Australia from Western Australia (Roebuck Bay) I; to SE corner of Gulf of Carpentaria.  
*G. o. olivacea* (Gould, 1838) – E Australia from base of Cape York Peninsula S extending inland to W slopes of Great Dividing Range) to SE & SC Victoria, scattered records in extreme E coastal South Australia.



**Descriptive notes.** 9–11.5 cm; c. 7 g. One of the more striking members of genus. Nominate race has dark face, with blackish loreal line to eye, white supraloral spot extending to eye; grey-brown above, back faintly tinged olive, tail with broad black subterminal band and large dark-edged white spots on all except central rectrices; well-defined white chin and throat, bright yellow underparts; iris red; bill and legs black. Distinguished from rather similar *G. palpebrosa* by brighter coloration, white spots on tail, lack of dark head markings of male. Sexes alike. Juvenile is entirely yellow below, facial markings less contrasting, supraloral spot

yellow, eye and bill brownish. Races differ mainly in size, degree of tail spotting and bill size: *rogersi* is slightly smaller than nominate, marginally paler above, tail spots slightly smaller, richer yellow below; *cinerascens* is very like nominate but a little smaller, also paler and greyer above, tail spots slightly narrower. Voice. Song serves territorial and advertising function, may be given at any time (more often in spring), a pleasant repetitive musical whistled series on fairly even pitch, may continue for some time, similar to that of *G. fuscata* but stronger and less hesitant; also a repeated descending trill introduced by double notes. In New Guinea, birds presumably of race *cinerascens* have very distinctive high-pitched, delicate, silvery descending trill (not heard from Australian population). Short song phrases also given, also low-pitched anxiety or contact calls.

**Habitat.** Mainly open dry eucalypt (*Eucalyptus*) woodland and dense riparian vegetation in tropical, subtropical and temperate zones (from coast to ranges and hills, and semi-arid inland slopes and plains). Occasionally in remnant woods in farmland, or in gardens, open eucalypt savanna and paperbark (*Melaleuca*) forest in New Guinea, from coast to 650 m.

**Food and Feeding.** Insectivorous; wide variety of arthropod prey recorded, including beetles (Coleoptera), flies (Diptera), bugs (Hemiptera) including leop insects (Psyllidae), also wasps and ants (Hymenoptera), and moths (Lepidoptera). Forages singly, in twos or in small groups, will join mixed flocks with Grey Fantail (*Rhipidura albicapa*), Rufous Whistler (*Pachycephala rufiventris*), *Sericornis brevirostris*, *G. fuscata* and White-throated Honeyeater (*Macleodops albigularis*), forages among foliage and twigs at all levels, but especially in canopy, also occasionally on the ground. Frequently sallies and hovers.

**Breeding.** Season generally Aug–Jan, with additional records Mar–May; usually single brooded. Nest oval, domed, with hooded side entrance and long slender "tail", constructed from bark fragments bound with spider web, lined with feathers and/or fine vegetable fibres, slung from outer branch of tree or shrub, especially eucalypts, 2–12 m above ground; sometimes near wasp nest or at tree infested with ants, presumably for some protective advantage. Clutch 2–3 eggs, whitish or pale pink, marked with purple and red, sometimes in band around larger end, incubation period c. 18 days; nesting period c. 15–17 days. Nests parasitized in Australia by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Bush Cuckoo (*Cacomantis variabilis*), and Horsfield's Cuckoo (*C. hypoleucos*), Shining (*Chrysomitris lucida*) and Little Bronze-cuckoos (*Chrysomitris minutifrons*).

**Movements.** Resident in New Guinea. Resident over much of range in Australia, but most S breeders seemingly move N, returning in Aug–Nov, males arriving first. Vagrant in Tasmania.

**Status and Conservation.** Not globally threatened. Widely distributed and common to uncommon in N & E Australia; uncommon and with rather relict distribution in New Guinea. Found in New Guinea only in restricted S savanna belt, which is subject to clearance and severe fires, worsening as population rapidly increases; this population is potentially "Vulnerable".

**Bibliography.** Anon. (1999), Barrett *et al.* (2003), Barrett *et al.* (2003), Beecher *et al.* (1986), Bell (1984a), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990), Ford, H. A. *et al.* (1986), Ford, J. R. (1978b), Frith & Frith (1995), Goodfellow (2001), Hall (1974a), Hartert (1940), Higgins & Peter (2002), Keesen-Recher (1997), Mack & Wright (1996), May & Rand (1937), McGill (1970), Meise (1931b), Nielsen (1996), North (1903), Officer (1961), Pizzey *et al.* (2005), Rand & Gilliard (1967), Schodde & Mason (1999), Schodde & Tideman (1990), Serventy *et al.* (1982), Slater *et al.* (2003), Stresemann & Paludan (1932a, 1932b), Wieneke (1988).





# Genus *ACANTHIZA* Vigors & Horsfield, 1827

## 48. Papuan Thornbill

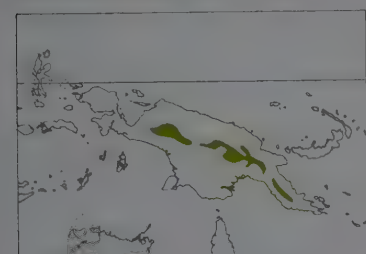
### *Acanthiza murina*

**French:** Acanthize de Nouvelle-Guinée **German:** Papuadornschnabel **Spanish:** Acanthiza Papú  
**Other common names:** Bar-tailed/De Vis's Thornbill, New Guinea (Mountain) Thornbill, De Vis's Tree-warbler

**Taxonomy.** *Gerygone murina* De Vis, 1897, Mount Scratchley, 12,200 feet [c. 3720 m], south-east New Guinea.

Has similarities with *A. katherina*; suggestions that the two species evolved from a common ancestor in New Guinea needs to be tested by genetic analysis. Monotypic.

**Distribution.** Mountains of New Guinea from Snow Mts E to Owen Stanley Range.



**Descriptive notes.** 9–10 cm. Small, pale-eyed drab thornbill. Head and upperparts are brownish-olive, forehead indistinctly mottled lighter (feathers having dark tips and pale bases); cheek and side of throat mottled light (salt-and-pepper effect), often quite dark-looking lores and ear-coverts; remiges edged pale, with darker centres of tertials; tail with broad blackish subterminal band and pale greyish to whitish tip; dingy pale greyish below, sometimes with buffy wash on underparts; iris whitish to yellowish, bill black or dark brown, pale base of lower mandible; legs variably black, dark brown or light brown, sometimes with yellow

on soles. Sexes alike. Juvenile undescribed. **Voice.** Song a series of pairs of notes, first higher-pitched than second. Squeaky, slightly raspy but sweet note "see tee to to", given constantly during foraging and interspersed with harsher scolds and rattles; can sound a bit like a fledgling bird with a "teeyuuk teeyuuk teeyuuk" or "teut-teut" series.

**Habitat.** High-altitude montane forest and forest edge, rarely as low as c. 1930 m, and commonest above 2500 m and to timber-line; one of the passerines living at highest elevation in New Guinea.

**Food and Feeding.** Primarily insectivorous; will visit flowering trees, but uncertain whether for insects or to exploit nectar. Seeds, fruit and flowers found in gizzard. Active feeder in flocks of 3–10 individuals, or in parties of five or six; sometimes seen in presumed pairs. Flocks may occupy adjacent trees and call constantly while foraging, often associating with *Sericornis nauhuysii* or *Sericornis papuensis*. Feeds from canopy down to c. 4–5 m, and seen neither on ground nor in shrub layer; rather like *A. katherina* in habits. Gleans from foliage and small twigs, sometimes on larger branches, moving systematically from one tree to the next.

**Breeding.** Largely unknown. Nest domed, with side entrance, located in forest tree; two young in Oct were fed by three adults, which suggests that co-operative breeding strategy may sometimes be used. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains EBA. Fairly common but local species of high altitudes. The remote and inaccessible habitat should ensure its security from major habitat loss.

**Bibliography.** Beecher *et al.* (1986), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961a), Gregory & Johnstone (1993), Keast (1978a), Loke Wan Tho (1957), Mayr & Rand (1937), Mayr & Serventy (1938), Rand & Gilliard (1967).

## 49. Mountain Thornbill

### *Acanthiza katherina*

**French:** Acanthize des montagnes **German:** Bergdornschnabel **Spanish:** Acanthiza Montana

**Taxonomy.** *Acanthiza katherina* De Vis, 1905, Bellenden Ker Range, north-eastern Queensland, Australia.

Closely related to *A. pusilla*, and has been thought to form a superspecies with it. Has similarities with *A. murina*; suggestions that the two evolved from a common ancestor in New Guinea needs to be tested by genetic analysis. Monotypic.

**Distribution.** NE Australia: highlands of NE Queensland from Shipton's Flat (near Cooktown) S to Paluma Range (near Townsville), extending inland to Atherton and Windsor Tablelands.



**Descriptive notes.** 10–10.5 cm; 7 g. Medium-sized thornbill. Head, hindneck and side of neck are greyish-olive, with fine creamy scalloping on forehead, indistinct fine whitish streaking on ear-coverts and malar area; narrow inconspicuous whitish partial eyering (around lower half of eye); upperparts greyish-olive, slightly brighter olive on rump, with tawny-buff uppertail-coverts; uppertail greyish-brown, broad diffuse blackish subterminal band and pale greyish tips; remiges with fine pale greyish or olive fringes (forming inconspicuous pale stripe on primaries); tertials dusky-centred; chin to breast off-white, suffused greyish-olive on side of breast, all freckled with indistinct dark streaks of mottling, rest of underparts pale yellow, washed dull olive or greyish-olive on flanks, undertail dark grey with broad blackish subterminal band; iris whitish or cream; bill black, sometimes pale greyish base of lower mandible; legs blackish or grey-brown to olive-grey. Sexes alike. Juvenile is like a duller

version of adult, with brown (not pale) eye. **Voice.** Song, frequently given when foraging, a sweet, trilled short melodious series with ratty underlying twitter, quite similar to that of *A. pusilla* but lacking latter's harsher scolding notes. Also a loud, shorter and less trilled sequence, notes more separated. Song seems to function also as contact call, and perhaps advertises territory.

**Habitat.** Tropical rainforest, at 450–1600 m; likes quite dense formations with *Calamus* vines and dense canopy. Recorded also in riparian forest adjacent to rainforest.

**Food and Feeding.** Spiders (Araneae) and insects, including beetles (Coleoptera), flies (Diptera), shield-bugs (Pentatomidae) and ants (Formicidae). Forages singly, in presumed pairs or in small family groups, seemingly well spaced (nearest group often more than 100 m away). Strongly arboreal, foraging in outer foliage from lower levels to canopy, from c. 1 m upwards, much preferring middle to higher levels; seldom (perhaps never) on ground, and avoids shrubs and *Lantana* thickets; behaviour similar to that of *A. murina*. Gleans from leaves and flowers; sometimes hovers and sallies. Joins mixed feeding flocks with *Sericornis kerri*, *Gerygone mouki*, Golden Whistler (*Pachycephala pectoralis*) and Grey Fantail (*Rhipidura albiscapa*); also with *Sericornis magnirostra* at lower elevations.

**Breeding.** Season Aug–Nov. Nests as simple pair, but suggestion also of occasional co-operative breeding. Both sexes believed to construct nest, a hanging bulky domed structure with slightly hooded side entrance, constructed from dry grass or fibres of palms, vines and ferns, coated with green moss and usually lined with feathers, 12.5–20 cm long and 8–12 cm wide, with entrance diameter 3.5–4 cm, larger and bulkier than nest of *A. pusilla* and more heavily coated with moss (suggested that moss coating may serve as rainproofing in wet environment of mountains, and is certainly useful camouflage); from 65 cm to c. 9.1 m above ground in tree or sapling, usually among twigs and leaves near end of branch. Clutch size reported as 2–3 eggs, but few known nests often have only 1 or 2, eggs pinkish, finely spotted brown, most spots at larger end, similar to or indistinguishable from those of *A. pusilla*. No other information. Longevity: in ringing studies, individual ringed as an adult was recovered 8 years 10 months later.

**Movements.** Sedentary; of 98 recoveries of ringed individuals (involving 76 birds), all were less than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Queensland Wet Tropics EBA. Quite common within its upland rainforest habitat in far N Queensland, where a characteristic species of the higher elevations. Much of its habitat lies within World Heritage designated sites and national parks. Potentially longer-term risk associated with climate change, resulting in modification of such habitats.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Campbell (1926, 1936), Christidis & Boles (1994), Garnett & Crowley (2000), Griffin (1974, 1995), Higgins & Peter (2002), Keast (1978a), McGill (1970), McKean & Bestie (1982), McKean & Hitchcock (1969), Morcombe (2003), Nielsen (1996), Pizzey *et al.* (2005), Robinson (1972), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), White (1946), Wieneke (1992a).

## 50. Brown Thornbill

### *Acanthiza pusilla*

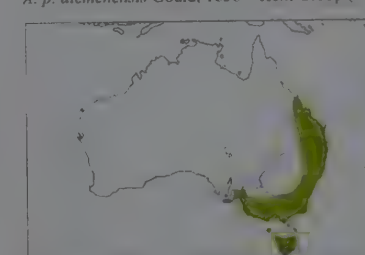
**French:** Acanthize mignon **German:** Roststirn-Dornschnabel **Spanish:** Acanthiza Parda  
**Other common names:** Brown/Brown-rumped/Large-billed/White-scaled Tit, Broad-tailed/Scrub Thornbill, Dusky/Dwarf Warbler, Brown-tail

**Taxonomy.** *Motacilla Pusilla* Shaw, 1790, region of Port Jackson, New South Wales, Australia.

Taxonomy complex. Has been thought to form a superspecies with *A. katherina*. Probably forms a superspecies with *A. apicalis*, with which has often been treated as conspecific; some hybridization between the two likely in SE South Australia, where individuals with intermediate plumage occur. *A. ewingii* would possibly belong with this superspecies, but sympatric with present species in Tasmania; was presumably the original colonizer, present species having colonized or recolonized via land-bridges when climate was warmer and drier. Molecular-genetic studies suggest existence of two genetically differentiated assemblages, one in New South Wales and E Victoria, the other in South Australia and Australian Capital Territory; race *diemenensis* seems to be genetically more like *A. apicalis*; general trend of increasing flavenoid pigmentation from S to N, also of broader white edges of rectrices and smaller size. Proposed race *mcgillii* (Clarke Range N to Proserpine, in E Queensland) is considered synonymous with *dawsonensis*; proposed race *bunya* (E Queensland S from Broad Sound, and NE New South Wales S, E of Great Dividing Range, to R Tweed) seems to relate to an intergrade population between nominate and *dawsonensis*. Name *archibaldi* was unnecessarily introduced as a replacement name for *magnirostra*, mistakenly believed to be preoccupied, but latter can not now be reinstated. Five subspecies recognized.

**Subspecies and Distribution.**

- A. p. dawsonensis* A. G. Campbell, 1922 – coastal ranges of CE Queensland, in E Australia.
- A. p. pusilla* (Shaw, 1790) – coasts of from SE Queensland S to Victoria and SE South Australia.
- A. p. zietzi* North, 1904 – Kangaroo I, off South Australia.
- A. p. archibaldi* Mathews, 1910 – King I, in Bass Strait.
- A. p. diemenensis* Gould, 1838 – Kent Group (in NE Bass Strait) and Tasmania (mainly C & E).



**Descriptive notes.** 9–11.5 cm; 7 g. Medium-sized red-eyed thornbill. Nominative race is olive-brown above, with pale scalloped rufous-brown forehead, paler grey-brown lores and feathers around eye (accentuating rather beady dark eye); rufous-brown rump patch; tail grey-brown, feathers narrowly edged whitish (when plumage fresh), blackish subterminal band and paler greyish tip; fine pale edgings of remiges (may form pale wingpanel); throat and underparts off-white, grading into cream or yellowish on vent and undertail-coverts, washed pale buff or yellow-brown on flanks, and finely streaked blackish on chin to breast, undertail grey, black with pale greyish narrow tip; iris dark red or red-brown; bill black or grey-black, sometimes paler base of lower mandible; legs grey-black to flesh-brown or purple-brown. Sexes alike. Juvenile is similar to adult but less well marked, with bill paler, iris dark brown to

On following pages: 51. Inland Thornbill (*Acanthiza apicalis*); 52. Tasmanian Thornbill (*Acanthiza ewingii*); 53. Chestnut-rumped Thornbill (*Acanthiza uropygialis*); 54. Slaty-backed Thornbill (*Acanthiza robustirostris*); 55. Western Thornbill (*Acanthiza inornata*); 56. Buff-rumped Thornbill (*Acanthiza reguloides*); 57. Slender-billed Thornbill (*Acanthizairedalei*); 58. Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*); 59. Yellow Thornbill (*Acanthiza nana*); 60. Striated Thornbill (*Acanthiza lineata*); 61. Southern Whiteface (*Apheloccephala leucopsis*); 62. Chestnut-breasted Whiteface (*Apheloccephala pectoralis*); 63. Banded Whiteface (*Apheloccephala nigrificata*).



grey-brown or olive (sometimes pale grey), legs much paler; may have pinkish gape when very young. Races vary in bill and/or tarsus measurements and minor plumage details; *diemenensis* is very like nominate but has shorter tarsus, plumage slightly brighter above, marginally paler below, breast streaks finer, *zietzi* has longer bill than nominate, paler forehead markings, darker and less olive upperparts, browner (less rufous-tinted) upperpart-coverts, paler flanks; *archibaldi* has much longer bill, forehead and forecrown more rufous and unmarked; *diemenensis* is larger than nominate, with longer wing and bill, rusty forehead with scalloping sometimes extending to forecrown, upperparts somewhat paler and greyer (variable). VOICE. Varied, tuneful song quite loud, given all year (most often when breeding), "tzzt tzzt too weet et wrrrr" and similar, reputedly the most melodious song in the genus. Mimicry frequent, mixed within its own song, often given in "Whisper song", too; species mimicked include Eastern Yellow Robin (*Eopsaltria australis*), Superb Fairy-wren (*Malurus cyaneus*), Eastern Rosella (*Platycercus eximius*), Brown Treecreeper (*Climacteris picumnus*), White-eared Honeyeater (*Lichenostomus leucotis*), Golden Whistler (*Pachycephala pectoralis*), Grey Fantail (*Rhipidura albiscapa*) and Dusky Woodswallow (*Artamus cyanopterus*); reported also to have mimicked a captive Island Canary (*Serinus canaria*). Calls include "tzzt", like that of *Sericornis frontalis* but less harsh, and other soft "peep" calls very like those of *Sericornis humilis* and *Acanthornis magna*; alarm a high-pitched "see", also assorted squeaks and chirps which serve also as contact notes, also a rapidly repeated "tzzt-tzzt-tchit!" as contact and/or alarm call. Nestlings have high-pitched begging call.

**Habitat.** Habitats with dense shrub layer, including both wet and dry sclerophyll forests, regrowth, eucalypt (*Eucalyptus*) woodlands, dense riparian growth, shrublands, rainforest and heath. Found from coast and plains to c. 1200 m in ranges. Occupies mallee heathland in New South Wales, and sometimes found in pine (*Pinus*) plantations with well-developed understorey of native or exotic vegetation. Occurs in rural parks and gardens, sometimes in orchards, and also in narrow urban strips of native vegetation. Also present in coastal dune-scrub during the non-breeding season. In Tasmania mainly on slopes in winter, with *A. ewingii* in gulleys; uses gulleys more in summer but feeding higher in vegetation than latter species, thereby maintaining some degree of ecological separation.

**Food and Feeding.** Primarily insectivorous; fruit, seeds and nectar occasionally taken. Recorded food includes spiders (Araneae), and beetles (Coleoptera), bugs (Hemiptera) including lerp insects (Psyllidae), ants (Formicidae), caterpillars (Lepidoptera), grasshoppers (Orthoptera) and various other classes of insect; also snails (Gastropoda). Seeds, buds and flowers taken include both natives, such as *Banksia* and grass-tree (*Xanthorrhoea*) nectar, and exotics, e.g. *Rubus* fruit. Bread crumbs also noted. Mainly in presumed pairs and family parties, occasionally singly or in small flocks in winter. Predominantly arboreal gleaner, but will forage on ground; forages at all levels, mostly in understorey shrubs, using outer foliage of shrubs, vines, trees and saplings. Sometimes forages on twigs and trunks, and uses sallying and hover-sallying techniques. Observed to forage among seaweed in coastal dune-scrub in non-breeding season. A frequent member of mixed-species flocks, including those with *Sericornis frontalis*, *Chthonicola sagittatus*, *A. chrysorhoa* and Eastern Yellow Robin (*Eopsaltria australis*) near Canberra; near Bendigo (Victoria) recorded with 18 species of insectivore, including *A. lineata* and *A. reguloides*, *Chthonicola sagittatus* and Scarlet Robin (*Petroica boodang*); reportedly seldom in such flocks when breeding.

**Breeding.** Eggs on Jan-Jul, Jan and young in Aug-Jan, breeding cycle taking 7–11 weeks; sometimes double-brooded. Pair-bond long-term. Pair maintain all-purpose territory throughout year, and defends it during nesting season (when vocal advertisement more frequent); chases away intruding males by erecting head feathers, lowering wings, fanning tail and exposing rufous-brown rump. Female selects nest-site and builds nest, small and bulky, domed, with partly hooded entrance, made of coarse grass, bark strips, leaves, lichen, moss, fern fragments, wool, spider web and spider egg sacs, lined with feathers, hair, wool fur, fern hairs and soft plant down, sometimes decorated externally with cocoons and acacia (*Acacia*) flowers; on or near ground (c. 78% of 503 nests were below 1 m), mostly under small shrub, in grass tussock or among sedges and ferns, often attached to underside of fern fronds, or fork in stem or branches, among leaves and twigs or among dead leaves of fallen tree, also in prickly bush; of 482 nests, 25.9% were in grass, 13.9% in ferns, 9.7% in acacias, 8.5% in tea-tree (*Leptospermum*) or paperbark (*Melaleuca*); may build in old nest of *Sericornis citreogularis*; territory size in Canberra c. 2 ha, in New South Wales 0.25–3.5 ha, smallest where undergrowth densest. Clutch 2–4 eggs, usually 3, laid in morning at 48-hour intervals, white, tinged pink or buff, some freckled with dark, mainly in zone at large end; incubation by female, probably starting when clutch complete, incubation period 16–20 days; eggs hatch within 24 hours of each other, chicks brooded by female (sitting very tight), fed by both sexes, nestling period c. 16 days; for first 2 weeks fledglings remain perched together in dense cover to be fed, thereafter follow parents, each parent cares for one or two young, or male feeds all if second brood attempted; young dependent for c. 6 weeks and often fed up to 8 weeks; most female young disperse, young males may stay on natal territory through autumn and winter and occupy vacant site or disperse at next breeding season; juveniles sometimes remain with parents over winter, but may also form flocks. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*); suggestion that at one New South Wales site Fan-tailed Cuckoo arrives too late to parasitize main nests and lays only in replacements. Of 477 eggs in 167 nests, 226 (47.4%) hatched and 140 (29.4%) produced fledged young, equal to 0.83 young per nest; of 148 failed nests in Nest Record Scheme, predation probable main cause of loss of 85 (57.4%), desertion main cause of 32 (21.6%) and 27 (18.2%) parasitized by cuckoos. All females and c. 80% of males attempt to breed in first year. Long-term studies more than 17 years 5 months.

**Movements.** Adult females, but juveniles, exhibit winter dispersal; some altitudinal dispersal reported in Australian Capital Territory and Snowy Mts (New South Wales). Of 3704 recoveries of ringed birds, 104% were more than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Common and widespread over much of E and SE Australia and Tasmania. Precise distribution uncertain owing to difficulty in separating this species from *A. apicalis*. Race *archibaldi* of King I listed as "Critically Endangered"; possibly extinct, but reported to have been seen in 1966 and 1971.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Bell (1985), Bell & Ford (1986, 1990), Beudantic *et al.* (1999), Brown *et al.* (1996), Campbell (1926, 1936), Chrysorhoa & Botes (1994), Emerson *et al.* (1987), Ford *et al.* (1986), Frith (1969), Garnett & Crowley (2000), Green & Cockburn (2001), Green *et al.* (2004), Hall (1974a), Higgins & Peter (2002), Keast (1978a), May & Serventy (1938), McCarthy (2006), McGill (1970), Moncombe (2003), North (1994), Osborne & Green (1992), Pizzey *et al.* (2005), Ratkovsky & Ratkovsky (1977), Recher (1989), Recher *et al.* (1987), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Sutton (1927).

**Other common names:** Broad-tailed/Red-rumped/Red-tailed/Rufous-rumped/Inland Brown/Western Thornbill, Broad-tailed/Red-rumped/Red-tailed/White-scaled Tit, Broad-tailed/Red-rumped/Red-tailed/Tit-warbler, Whitlock's Thornbill/Tit (*whitlocki*), White-bellied Thornbill (*cinerascens*), Tanami Thornbill/Tit (*tanami*)

**Taxonomy.** *Acanthiza apicalis* Gould, 1847, Swan River and King George Sound, Western Australia. Taxonomy complex. Probably forms a superspecies with *A. pusilla*, with which has often been treated as conspecific; some hybridization between the two likely in SE South Australia, where individuals with intermediate plumage occur. Race *diemenensis* of *A. pusilla* seems to be genetically more like present species. Proposed race *tanami* (from grid interior in N Western Australia, Tanami district and Dalmore Downs, in Northern Territory, E to Duchess, in Queensland) is considered synonymous with *whitlocki*; described race *leucumensis* (humid coast of SW Australia) appears to refer to an intergrade population between nominate and *whitlocki*. Four subspecies recognized.

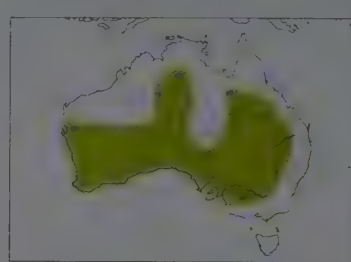
#### Subspecies and Distribution.

*A. a. whitlocki* North, 1909 – W & C Australia.

*A. a. apicalis* Gould, 1847 – S coastal and subcoastal Australia.

*A. a. cinerascens* Schodde & Mason, 1999 – CW Queensland.

*A. a. albiventris* North, 1904 – inland CE & SE Australia.



**Descriptive notes.** 9–11.5 cm; 7 g. Medium-sized red-eyed thornbill. Nominative race is grey-brown to brownish-grey above, with whitish or creamy-buff scalloping on forehead, paler grey-brown to off-white lores, narrow whitish eyering (best defined on lower portion), fine white mottling on cheek and ear-coverts; rich and contrasting rufous-brown rump patch; grey-brown tail with broad blackish subterminal band, paler greyish tip, white tips of outer rectrices; fine pale edgings on remiges (may form pale wingpanel); off-white below, grading into light grey brown wash on breast side and flanks, warmer buff on rear

flanks, and with fine but clear blackish streaks on chin, throat and breast (at distance can appear greyish-chested with pale belly, streaks not visible); undertail grey-black with pale greyish narrow tip; iris dark red or red-brown; bill black or grey-black, sometimes paler base of lower mandible; legs greyish-black to paler dark brown or grey-brown. Differs from very similar *A. pusilla* in having longer tail which often held cocked, more contrasting scalloping on forehead, greyish cast on upperparts, richer rufous-brown rump contrasting more with back, bolder black subterminal tailband and white tips on outer rectrices. Sexes alike. Juvenile is similar to adult but less well marked, streaking less well defined, upperbody slightly browner, bill duller with pale base of lower mandible (sometimes also of upper mandible), iris brown or paler greyish-cream or sometimes greyish-white, may have pale yellowish gape when very young. Races differ mainly in measurements and in minor plumage details: *whitlocki* is very like nominate but somewhat paler, with tailband slightly broader, male has shorter tail; *cinerascens* has longer wing than nominate, plumage paler than others, pale forehead markings whiter, streaking below less extensive; *albiventris* is very like nominate but has shorter tail and tarsus, upperpart-coverts more strongly rufous. VOICE. Musical warbling song with trills, and incorporating mimicry. One song of race *whitlocki* resembled "tee-twee twee-to-teeoo" series with interspersed harsher notes; *albiventris* can sound almost acrocephaline, with long chattering repetitive series, and a musical pachycephalid-like phrase descending at end. An individual in Western Australia mimicked Willie Wagtail (*Rhipidura leucophrys*), Grey Fantail (*Rhipidura albiscapa*), Rufous Whistler (*Pachycephala rufiventris*), some phrases of Pied Butcherbird (*Cracticus nigrogularis*) and "wee-loo" call of Bush Thick-knee (*Burhinus grallarius*), also made unsuccessful attempt to imitate Grey Shrike-thrush (*Colluricincla harmonica*) song; phrases from these songs incorporated into one repetitive theme which was sung all day, then changed on next day. Noted as mimicking call of Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Calls more penetrating than those of *A. pusilla*, with one harsh call similar to that of *Pyrrholaemus brunneus*, also a loud, clear whistled "chweeip" and a sharp "tsip-chip"; harsh buzzy notes when alarmed, also thin twittering contact call. Quite vocal during foraging, keeping up quiet musical series mixed with scolding chatter when in mixed flocks.

**Habitat.** Dense understorey in dry woodlands and sclerophyll forests, tall shrublands and also thick riparian formations. In Western Australia occurs in jarrah forest with thick undergrowth including grass-trees (*Xanthorrhoea preissii*) and heath, also in more open holly-leaved dryandra (*Dryandra sessilis*) woodland, jarrah and marri forests with understorey of bull banksia (*Banksia grandis*) and western sheoak (*Allocasuarina fraseriana*). Occurs also in wet sclerophyll karri forest and wandoo woodland, and in more open eucalyptus (*Eucalyptus*) woodland, on sand ridges with low banksia woodland, and in eucalypt-cypress pine (*Eucalyptus-Calitris*) formations; also in vegetated subcoastal dunes. Frequent in mallee woodlands with dense shrub layer including spinifex (*Triodia*), Callitris, tea-tree (*Leptospermum*), broombush (*Melaleuca uncinata*) and acacia (*Acacia*). Also in mallee heath of casuarinas (*Casuarina*), tea-trees and spinifex, banksia formations, and acacia woodlands, usually with dense chenopods. Occurs in rural parks and gardens, sometimes in farmland near state forests, shelter-belts, and narrow roadside remnant strips of native vegetation. Generally a species more of arid and semi-arid zones than is *A. pusilla*, although mostly avoids severe desert (e.g. Simpson Desert).

**Food and Feeding.** Primarily insectivorous, with seeds occasionally taken. Recorded items include spiders (Araneae), beetles (Coleoptera), bugs (Hemiptera), ants (Formicidae) and caterpillars (Lepidoptera), also wasps (Hymenoptera) and a variety of other arthropods; seeds taken poorly known, but include those of *Ammodendron*. Mainly in presumed pairs and family parties of 5–6 individuals, occasionally singly; sometimes in loose assemblages of up to 25 individuals in winter. Active and vocal all day. Forages at all levels, mostly in understorey shrubs, using outer foliage of shrubs, trees and saplings, sometimes on twigs and trunks but seldom forages on ground. Feeds predominantly by gleaning, also by sallying and hover-sallying. A core member of mixed-species flocks, including those with Splendid Fairy-wren (*Malurus splendens*), *A. chrysorhoa*, *A. uropygialis*, *Smicronis brevirostris*, *Aphelocephala leucopsis*, Grey Fantail (*Rhipidura albiscapa*), and Singing (*Lichenostomus virens*) and Brown Honeyeaters (*Lichmera indistincta*); recorded in feeding flocks with 13 species of insectivorous birds near Bolgart (Western Australia); less often in mixed flocks when breeding.

**Breeding.** Season Jul-Dec, mainly Sept–Nov. Nest compact, round or oval, and domed, with partly hooded side entrance near top, usually made of grass, bark strips and twigs, occasionally with leaves, lichen, moss, wool, spider web and spider egg sacs, lined with feathers, hair, wool, fur or soft plant down, 8.9–10.8 cm tall, c. 6.5–8.3 cm wide, entrance diameter 1.9–3.2 cm; usually 1.1 m from ground in low shrub, less often in small tree or sapling, sometimes suspended but more

## 51. Inland Thornbill

### *Acanthiza apicalis*

French *Acanthize acrolophye*

German Stelzschwanz-Dornschäufel

Spanish *Acanthiza Apical*



often supported, usually in fork or in foliage; wide variety of species utilized, e.g. paperbarks, eucalypts, acacias, casuarinas, tea-trees, bracken (*Pteridium*), *Eremophila*, *Callitris*, *Hakea* and grass; has nested in old stick nest of Chestnut-crowned Babbler (*Pomatostomus ruficeps*). Clutch 2–3 eggs, usually 3, laid daily, white to pinkish-white, blotched and spotted with dark all over, forming cap at large end; incubation period 19–21 days; nestling period 16–18 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and Shining (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Of 67 eggs in 26 nests, 24 (35.8%) hatched and 21 (31.3%) produced fledglings, equivalent to 0.8 young per nest. Longevity in ringing studies at least 11 years 10 months.

**Movements.** Resident; some movements reported but not well known, likely to be purely local. In Western Australia, sometimes appears on Swan coastal plain near Perth in Oct–Mar, especially with autumn rains, and local movements reported in that region and in C Australia; suggests post-breeding dispersal of immatures. Ringing studies indicate that most birds resident; all recoveries within 10 km of ringing site.

**Status and Conservation.** Not globally threatened. Widespread in much of arid and semi-arid mainland Australia, but absent from the most severe deserts. Precise distribution in SE of range uncertain owing to difficulty in separating this species from *A. pusilla*. Habitat clearance has caused declines in some areas, and destruction of roadside remnants in wheatbelt of Western Australia has resulted in local losses. Can persist in remnant vegetation in some developed areas, with shelter-belts and road verges important. Mining activities will presumably have adverse impact on habitat in some areas, but this species occupies a huge range and should be secure.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Campbell (1936), Carter (1924b), Christidis & Boles (1994), Emison *et al.* (1987), Garnett & Crowley (2000), Higgins & Peter (2002), Keast *et al.* (1985), Matthew & Carpenter (1990), Morcombe (2003), North (1904), Pizzey *et al.* (2005), Schodde & Mason (1999), Sedgwick (1986, 1988a), Serventy & White (1945), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003), White, S.A. (1921), Woinarski (2000).

## 52. Tasmanian Thornbill

### *Acanthiza ewingii*

**French:** Acanthize de Tasmanie

**German:** Tasmandornschnabel

**Spanish:** Acanthiza de Tasmania

**Other common names:** Ewing's Thornbill, Ewing's Tit/Tit-warbler, Browntail, Creek Tit

**Taxonomy.** *Acanthiza ewingii* Gould, 1844, Tasmania.

Genetically close to, and believed to have descended from, the *A. pusilla*–*A. apicalis* complex, being apparently closer to latter species. Sympatric with *A. pusilla*, and was presumably the original colonizer of Tasmania, former species having colonized or recolonized via land-bridges when climate was warmer and drier. Two subspecies recognized.

**Subspecies and Distribution.**

*A. e. rufifrons* A. J. Campbell, 1903 – King I., in W Bass Strait, off SE Australia.

*A. e. ewingii* Gould, 1844 – Furneaux Group (E Bass Strait) and mainland Tasmania.



**Descriptive notes.** 10.5–11.5 cm; 7 g. Nominate race has rufous-brown forehead with little or no pale scalloping; lores and feathers around eye grey-brown, suggesting broad pale eyering (emphasizing large dark eye), lower ear-coverts and malar area pale greyish, finely mottled dusky; crown and upperparts olive-brown, rufous-brown rump patch; tail as back, narrow black subterminal band, indistinct paler tip; remiges edged light brown, grading to rufous-brown at base of primaries (forming rufous-brown panel), alula, wing-coverts and tertial centres blackish; chin, throat and breast off-white or pale grey with diffuse and fine

dusky mottling, belly creamy white, flanks light brownish-grey, undertail-coverts white (often curling up on to rump side); undertail light brownish-grey with diffuse black subterminal band; iris dark red or red-brown; bill black, dark-tipped paler lower mandible (hard to see in field); legs black, dark brown or dark pinkish-brown. Differs from similar *A. pusilla* in having slightly longer tail, less contrasting rufous-brown rump, less strong streaking below. Sexes alike. Juvenile is very similar to adult, but greyer above, only faint mottling on chin, throat and chest, bill brown with yellowish underside of lower mandible, iris grey-brown. Race *rufifrons* is very like nominate but browner, with lighter and brighter rufous forehead, more diffuse breast mottling, slightly paler flanks. Voice. Sweet musical warbling prefaced by "tsit tsit" contact notes, then "chee chee chee" series with bubbling "wit wit wit" ending; also a musical, deeper, slightly trilled song, and such songs given also with harsh buzzy contact notes interspersed. Contact and alarm call "chit chit" followed by rattly note similar to that of *Sericornis humilis*; quiet chattering calls when foraging (mixed flocks with this species can be quite noisy). Voice overall similar to that of *A. pusilla*, but no mimicry reported.

**Habitat.** Habitats with dense shrub layer including sedges and tree-ferns, from sea-level to mountains, particularly in wetter habitats such as wet sclerophyll forest and temperate rainforest, often with antartec beech (*Nothofagus cunninghamii*); also in densely vegetated gulleys and along creeks in dry sclerophyll forest (occupied mainly by *A. pusilla*). Occurs in stunted subalpine forest with rich shrub layer, and dwarf coniferous forest above 1000 m, also in wet shrublands, and sedgelands dominated by button grass (*Gymnoschoenus sphaerocephalus*). On offshore islands found in drier heath habitats, including dry sclerophyll woodland on King I. and in all forest and shrub habitats on Flinders I. Occasionally seen in plantation pine (*Pinus*) forest, and occurs in dense regrowth following logging. Mosaic of habitat types on Tasmania enables co-existence with *A. pusilla* in same general area: present species predominates in much wetter W parts, occupying tea-tree (*Laportea*) swamps, with its congener in drier heath formations; above 500 m wet habitats predominate and it again becomes dominant, although both can still occur together.

**Food and Feeding.** Food includes spiders (Araneae), beetles (Coleoptera), flies (Diptera), bugs (Hemiptera), wasps (Hymenoptera) and lepidopterans, as well as a variety of other small arthropods, also some seeds. Occurs singly in presumed pairs or in small presumed family groups. Joins mixed-species flocks with *A. pusilla*, *Sericornis humilis* and *Leathia nana*; also in loose feeding flocks with just the first in those, perhaps less gregarious than *A. pusilla*. Mainly arboreal, forages at all levels, including on ground, in dry sclerophyll of NE Tasmania forages higher in vegetation (up to 20 m) in winter, lower (to 5 m) in summer. Feeds mostly by gleaning from foliage, twigs and bark, also some 'sallying'. Much overlap in foraging with *A. pusilla* in summer; year studies indicated that present species foraged mostly in gully, whereas *A. pusilla* mainly on slopes

in winter and, in summer, making more use of gulleys but feeding higher in vegetation than present species, thereby maintaining some degree of separation.

**Breeding.** Season Aug–Jan, with eggs recorded mid-Oct to Jan. Breeds as simple pair. Nest built by both sexes, in one case taking 24 days; neat, compact, rounded, domed structure, with side entrance usually with hood-type flap (hinged to fall and nearly cover hole), can resemble little green ball, built of tightly woven soft green moss or grass, with bark strips, leaves, decayed wood, lichen and spider egg sacs, bound with cobweb and tree-fern fibres, lined with fine grass, feathers, fur or plant down; usually suspended 0.05–4 m above ground from twig, fern frond or fork of shrub, in dense vegetation, often bracken (*Pteridium*) or tea-tree or paperbark (*Melaleuca*), or rushes or grasses, often by creek or swamp. Clutch 3–4 eggs, white or pale pink, spotted with chestnut, sometimes freckled with dark, mainly in zone at large end; incubation by female alone; no information on duration of incubation and nestling periods. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Longevity in ringing studies more than 5 years 11 months.

**Movements.** Resident; of 259 recoveries of 128 individuals, all were less than 10 km from ringing site. Some possibly nomadic outside breeding season, when may move into more open habitats.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Tasmania FBA. Quite common in Tasmania; King I race *rufifrons* formerly rare, but has increased in numbers. Absent or rare in heavily cleared farming areas. Occupies dense regrowth after logging, but (as with all Tasmanian woodland birds) industrial-scale eucalypt (*Eucalyptus*) and pine plantations, with consequent heavy spraying of pesticides and herbicides, has adverse impact on floristic diversity and, doubtless, on arthropod composition and density; cumulative effects as yet unknown. Much suitable habitat is, however, within national parks and World Heritage areas, and the species should be secure.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Cate (1994), Campbell (1926, 1936), Christidis & Boles (1994), Garnett & Crowley (2000), Green (1989, 1995), Higgins & Peter (2002), Mayr & Serventy (1938), McGill (1970), Morcombe (2003), North (1904), Pizzey *et al.* (2005), Ratkovsky & Ratkovsky (1980), Schodde & Mason (1999), Serventy *et al.* (1982), Sharland (1925), Slater *et al.* (2003), Thomas (1979).

## 53. Chestnut-rumped Thornbill

### *Acanthiza uropygialis*

**French:** Acanthize à croupion roux

**German:** Braunbützel-Dornschnabel

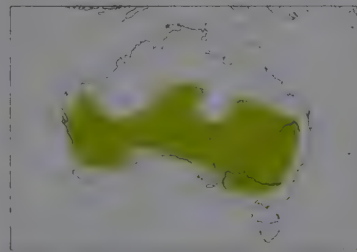
**Spanish:** Acanthiza Culirroja

**Other common names:** Chestnut-backed/Chestnut-tailed Thornbill, Chestnut-backed/Chestnut-rumped/Chestnut-tailed Tit, Chestnut-backed/Chestnut-rumped/Chestnut-tailed Tit-warbler

**Taxonomy.** *Acanthiza uropygialis* Gould, 1838, inland New South Wales, Australia.

Recent analysis of mitochondrial DNA suggests that this species may be close to *A. iredalei*; more study needed. Variation clinal, plumage becoming darker from N & W to S & E, and palest inland. Naming of geographical races *moora* (in SW Australia) and *augusta* (arid interior of S. E. to Flinders Ranges, in South Australia) considered unwarranted. Monotypic.

**Distribution.** Semi-arid and arid zones of S Australia; absent from tropical N and from E seaboard.



**Descriptive notes.** 9–11 cm; 6 g. Medium-sized, rather pale thornbill with pale eyes. Plumage is pale grey-brown to brownish-grey above, with distinct white scalloping on dark brown forehead, variable rufous-brown tint on upper forehead and crown; lores off-white, narrow pale eyering, with ear-coverts and narrow band over eye mottled off-white; rump chestnut-brown, contrasting strongly with upperparts and primarily black tail, latter with narrow greyish-white tip; alula, primary coverts and centres of tertials blackish-brown, tertials with narrow whitish fringes, greater upwing-coverts with indistinct narrow light

brown or creamy wingbar across tips (abraded with wear), primaries and outer secondaries with off-white edges (forming diffuse pale strip on wing), unmarked off-white below, sometimes washed pale grey on breast side or on chin, throat and breast, flanks washed light buff; undertail grey-black with narrow greyish-white tip; iris cream or whitish; bill black, sometimes pale grey base of lower mandible; legs black or grey-black. Sexes alike. Juvenile is very similar to adult but duller, forehead less scalloped, wingbar more prominent, remiges with rusty-brown (not white) fringes, iris slightly duller; pale yellow gape when newly fledged. Voice. Song a sweet, trilling, rapid "sweet-tee" series, shorter and less high-pitched than that of *A. chrysorhoa*; also a clear, whistled "cheweeep" series or a faster musical warbling. The "sweet tee" is given also as call note; scolding, disyllabic "chik chik" in flight, and similar but quieter call when foraging; also a plaintive high-pitched "see" or "seep", and "tseu", often repeated.

**Habitat.** Dry woodland and shrubland, especially mallee with spinifex (*Triodia*), *Eremophila* and *Cassia*, and mulga with chenopod understorey; also in thick riparian vegetation around watercourses, lakes and other wetlands. Can use secondary habitats such as cattle pasture, firebreaks and remnant roadside strips, so long as enough low cover remains. Occurs on lowland plains, sand dunes, floodplains, rocky hillsides and plateaux and in gorges.

**Food and Feeding.** Reported food items mainly arthropods, including spiders (Araneae), beetles (Coleoptera), bugs (Hemiptera) including lepidopterans (Psyllidae), also wasps and ants (Hymenoptera), grasshoppers (Orthoptera), lepidopteran larvae and variety of other insects; occasionally seeds of chenopods and of *Portulaca*, *Urtica* and *Anyema quandang*, also unspecified buds. Usually seen in small parties of up to six individuals, seldom singly; gregarious, often in flocks of 10–20 individuals outside breeding season. Arboreal, foraging mostly on low trees and shrubs, and less frequently terrestrial. Forages mainly by gleaning, from twigs, foliage, bark and ground; also probes loose bark, and seen to probe fence posts and to hang beneath fence rails; searches on fallen trees and branches (as where mulga has been knocked over for stockfeed at times of drought). Also sallyes in air. Sometimes seen at flowers. Frequently associates with other members of family (*A. chrysorhoa*, *A. apicalis*, *Aphelocoma leucophaea*, *Sericornis frontalis*, *Psittacops melanops*, *Sericornis magnirostris*, also with *Leucophaea leucophaea*), Grey Fantail (*Rhipidura albicollis*), fairy-wrens (*Malurus*) and honeyeaters (*Myiophobus*); at one site in South Australia, fed with three congeners (*A. chrysorhoa*, *A. reguloides*, *A. nana*) in flocks of up to 100 birds, sometimes with similar numbers of Silvereyes (*Zosterops lateralis*); in Queensland associates with at least 14 other insectivorous species, in-



cluding Red-capped Robin (*Petroica goodenovii*), Rufous Whistler (*Pachycephala rufiventris*) and Spotted Pardal (*Ptilinopus maculatus*).

**Breeding.** Season Jun–Dec, with eggs Jul–Dec; can be double-brooded or possibly triple-brooded. Most records of breeding involve pairs, but occasionally breeds co-operatively, as chicks sometimes fed by three adults. Nest built by both adults, small, neat and domed, with rounded entrance at side or near top, made of dry grass, bark strips, plant stems, moss, lichen and spider web, lined with feathers, wool or fur, one nest was 10.2 cm tall, 7.6 cm wide, with entrance diameter 3.2 cm; sited c. 0.5–2 m above ground, usually in hollow in living or dead tree (e.g. mallee and mulga) or in stump, log, fence post or large fallen branch, sometimes behind bark, or in foliage or hollow in trunk of shrub; odd opportunistic sites include hole in wall, old tin, water pipe, telegraph pole, fold of a sack, old trousers by abandoned hut, and eye socket of horse's skull. Clutch 2–4 eggs, usually 3, laid at 2-day intervals. Flesh-white, finely speckled with dark all over, but forming cap at large end; incubation period c. 19 days; chicks fed by both parents, nestling period c. 18–20 days; both adults feed fledglings, family members stay together for a while after breeding, juveniles then disperse and move about in groups of two or three in late summer and autumn. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Success: of 32 eggs in 11 nests, 16 (50%) hatched and 13 (41%) produced fledged young, an average of 1.1 young per nest. Longevity in ringing studies more than 5 years 7 months.

**Movements.** Resident, some local movements of up to c. 2.5 km reported, but not well known. Odd records of birds outside usual range in Australian Capital Territory, NE New South Wales and South Australia. Apparent lower recording rates in summer may be due to hot weather, reduced observer activity and the species' more cryptic behaviour. Of 295 recoveries of 198 individuals, all were less than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Widespread species of much of arid and semi-arid mainland Australia; absent from the most severe deserts. Habitat clearance has caused declines in some areas, and destruction of roadside remnants in wheatbelt of Western Australia has led to local losses.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Britton (1997), Campbell (1936), Chisholm, A.H. (1935), Chisholm, E.C. (1938), Christidis & Boles (1994), Close & Lynch (2001), Goodwin (1967), Hall (1974a), Higgins & Peter (2002), Matthews & Carpenter (1990), Matthews & Rogers (1997), Mayr & Serventy (1938), McGill (1943), Morcombe (2003), Morris & Woolter (2001), North (1904), Paton (1975), Pizzey *et al.* (2005), Rix (1976), Ryan (1983), Saunders & Ingram (1995), Schodde (1965a), Schodde & Mason (1999), Sedgwick (1936, 1956), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003), White, H.L. (1915), White, S.R. (1950b), Woinarski (1985, 1989a).

## 54. Slaty-backed Thornbill

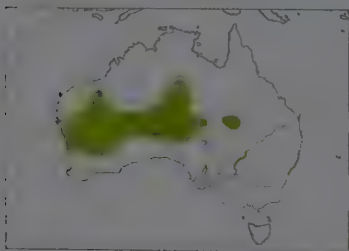
### *Acanthiza robustirostris*

**French:** Acanthize ardoisé **German:** Graurücken-Dornschnabel **Spanish:** Acanthiza Pizarrosa  
**Other common names:** Grey-backed Thornbill, Large-billed/Robust/Robust-billed Thornbill, Thick-billed Thornbill/Tit

**Taxonomy.** *Acanthiza robustirostris* Milligan, 1903, Day Dawn, Murchison District, Western Australia.

**Monotypic.**

**Distribution.** Arid and semi-arid regions from WC Western Australia E to S Northern Territory, N South Australia and W Queensland.



**Descriptive notes.** 9.5–11.5 cm; 6 g. Medium-sized rather plain thornbill with relatively stout bill. Plumage is slate-grey above, with fine blackish streaking on forehead and crown (hard to see), diffuse off-white anterior supercilium, diffuse narrow dusky stripe across lores, white broken eyering, diffuse fine white mottling on ear-coverts; uppertail-coverts and extreme base of tail tawny, contrasting prominently with upperparts and mainly black tail, latter with narrow greyish-white tip; primary coverts, centres of tertials and alula slightly darker grey, off-white tips of greater coverts forming narrow wingbar (reduced through wear), prominent whitish fringes of tertials, fine whitish edges of remiges (forming pale cap on primaries), off-white below, sometimes pale grey wash on chin and throat, pale buff on breast-side shading to pale buff on flanks; undertail grey-black with prominent narrow greyish-white tip; iris dark red or red-brown; bill black; legs black or grey-black. Distinguished from very similar *A. uropygialis* mainly by dark eye, white eyering, blackish head streaks, greyer upperparts. Sexes alike. Juvenile is similar to adult, but with browner crown and upperparts, fainter tertial fringes, brown wingbars on median and greater coverts, brown crown and upperparts, a 'chup-wip, cheewoowep chup-wip' series, interspersed with sharp higher-pitched twittering, and sometimes with harsh notes mixed in; 'wi-pu-chew' phrase said to be a 'chub-chub' call, short phrase with some 'chub-chub-chub' notes may have been mimicry of a Woodward Honeyeater (*Phylloscopus thibroni*). Calls continually when feeding, and gives a 'tseep' call quite similar to that of *A. apicalis* and *A. uropygialis*, perhaps involving mimicry; 'tseep' or 'tseep' contact calls, a quite harsh 'tew tew tew' series, and a characteristic harsh 'tseep' or 'tseep' call.

**Habitat.** Primarily mulga (*Acacia aneura*) woodland with understorey of emu-bush (*Eremophila*), on sandplains, rocky areas and low ranges in arid and semi-arid zones. Usually avoids mallee, and may prefer open woodland or mixed areas. Occurs also in mulga with spinifex (*Triodia*) or saltbush (*Haloeris*) in some dense vegetation, and in mulga with spinifex. Feeds by gleaning from foliage and ground.

**Food and Feeding.** Insectivorous, usually seen singly or in pairs, sometimes in small groups of up to eight individuals, with smaller groups likely to be family parties; less gregarious than *A. uropygialis*. Feeds by gleaning from foliage and ground, and more rarely, *A. apicalis*; seen also with *Amphipodiceps leucopis*. Mainly arboreal, foraging in outer foliage of low shrubs and trees, occasionally on ground, but rarely on ground, less often by sallying and hovering, at all times feeding habitually, mostly on leaves but sometimes on bark of branches and trunks. Often vocal while feeding.

**Breeding.** Season Jul–Nov, sometimes double-brooded. Reported as breeding in pairs, but very poorly known. Nest built by female, inconspicuous, small loose sphere with slightly hooded side entrance, domed for entrance, built in a hole in a log, branch or stump (thin and fragile but cup strongly, close, knot, woven around base of nest plant, made of dried grasses) and small twigs bound with spider web, with spider egg sacs and lichen on lower exterior, lined with hair, feathers,

plant down and soft material, entrance hole circular and lined with hair-like material; sited 1–2 m above ground (sometimes lower, or up to 5 m) in shrub or low tree, especially mulga or emu-bush, also other acacias and saltbush. Clutch usually 3 eggs, sometimes 2, white or very pale pink, blotched and spotted dark, with heavier blotches forming band around larger end; no information on incubation and nestling periods' chicks and fledglings fed by both parents. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Presumed to be sedentary, although some suggestion of local seasonal wandering. **Status and Conservation.** Not globally threatened. Uncommon and poorly known species of remote semi-arid and arid regions. Much of its habitat is in designated national parks and reserves, and the species should be secure.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Campbell (1936), Carpenter & Mathew (2002), Christidis & Boles (1994), Ford & Parker (1973a), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Matthews & Rogers (1997), Mayr & Serventy (1938), McGill (1970), Morcombe (2003), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003).

## 55. Western Thornbill

### *Acanthiza inornata*

**French:** Acanthize sobre **German:** Walddornschnabel **Spanish:** Acanthiza Sencilla  
**Other common names:** Western Tit-warbler, Bark/Master's/Plain-coloured Tit

**Taxonomy.** *Acanthiza inornata* Gould, 1841, Swan River, Western Australia.

Genetically closest to *A. reguloides*, perhaps forming a superspecies with it. Proposed race *mastersi* (wettest portion of S coast of SW Australia, E to Albany) may be worthy of recognition, as sharp gradation occurs between darker population in extreme S and paler one to the N; further study required. Tentatively treated as monotypic.

**Distribution.** SW Western Australia; single record from E of Kalbarri, farther N in central subcoastal zone.



**Descriptive notes.** 8–10.5 cm; 7 g. A small, plain thornbill with pale eye. Has fine creamy-buff scalloping on forehead, fine creamy-buff streaking and spotting on ear-coverts; crown and upperparts olive-brown, slightly warmer on uppertail-coverts and base of tail; uppertail olive-brown, tinged greyish, with narrow black subterminal band; primary coverts, tertial centres and alula slightly darker brown, fine off-white edges of remiges (forming pale linear wingpanel on primaries); lores and underside creamy buff, with faint dusky scalloping or flecking on chin, throat and upper breast, flanks washed yellowish; undertail brownish-grey

with faint dark subterminal band; iris cream; bill black, dark brown or grey-black, sometimes paler base of lower mandible; legs black or dark brownish-grey. Readily distinguished from congeners by combination of drab coloration, no obvious rump patch, pale eye. Sexes alike. Juvenile is similar to adult but browner above, scalloping fainter, light brown fringes of tertials and greater coverts (forming indistinct narrow wingbar); yellowish gape when very young. Voice. Tends to be quiet and fairly unobtrusive. Song, reportedly used also as contact and in agonistic behaviour, described as 'pitta-pitta-pitta', similar to those of *A. reguloides* and *A. ireadalei* but less tinkling and more constant in pitch; also a sweet, twittered, fast 'twee twee twee twee' mixed with 'pit pit' notes, and a musical 'twitchee twitchee twitchee' series interspersed with trills. Reported as mimicking Western Rosella (*Platycercus icterotis*), Grey Fantail (*Rhipidura albiscapa*) and Grey Currawong (*Strepera versicolor*), but this seems unusual.

**Habitat.** Wandoo woodland, jarrah and marri forest with understorey of shrubs, also flooded gum (*Eucalyptus rudis*) forest, riparian formations, mallee and mixed woodland; occurs also in heathland and *Banksia* woodland, and sometimes in wooded parks and gardens. Seems to require shrub understorey and ground litter such as logs and woody debris. From coastal plains to low hills.

**Food and Feeding.** Primarily insectivorous. Food includes beetles (Coleoptera), bugs (Hemiptera), wasps and ants (Hymenoptera), and lepidopteran larvae; also takes nectar from *Grevillea*, perhaps an adaptation to floristically rich region in which it lives. Often seen in presumed pairs, occasionally singly or in small presumed family groups of 3–5 individuals, and can occur in flocks of up to 20; will join mixed-species flocks with *A. chrysorrhoa*, *A. apicalis* and Grey Fantail (*Rhipidura albiscapa*). Forages in low shrubs and trees, up to canopy level, also often on ground; terrestrial foraging may be more frequent in winter. Feeds by gleaning from foliage, and reported also as probing into bark and sallying.

**Breeding.** Season Aug–Feb, occasionally from mid-Jul. Breeds as pair, or sometimes in group with three or four individuals attending one nest. Nest oval, domed and loosely structured, with side entrance near top, constructed from dried grasses, twigs, plant stems, rootlets, bark strips, plant down, dry leaves or flowers, bound with spider web, lined with feathers, fur or plant down; one nest was 10.8 cm tall, 7.7 cm wide, with entrance 3.2 cm across and 2.5 cm vertically; 0.6–1.3 m (average 4.7 m) above ground in tree or large shrub, including wandoo, marri, jarrah, casuarina (*Casuarina*), banksia and *Hakea*, or in grass-tree (*Xanthorrhoea*), sited against trunk in well-foliaged tree, in fork of tree or shrub, behind loose bark, in tree hollow, or among thick leaves or dense dry leaf skirt or crown of grass-tree. Clutch usually 3 eggs, laid at 2-day intervals, white to pinkish-white, flecked dark, with band around larger end; incubation by female, period 18–21 days; chicks fed by both sexes, nestling period 17–19 days. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*); of 226 nests over 4 years at one study site, 16 (7%) were parasitized by former species and 18 (8%), by latter. Success: in one study of at least ten nests, failure rate reported as 48%, fires depress breeding rate and success through reduction of food supplies, and many pairs may not breed in year following fire. Longevity in ringing studies more than 5 years 10 months.

**Movements.** Resident, with perhaps some local post-breeding wandering. Of 65 recoveries concerning 60 individuals, all were within less than 10 km of ringing site; one recovered 6 km away one year later.

**Status and Conservation.** Not globally threatened. Locally common to uncommon. Density can reach 40 groups/100 ha, but drops after fires. Range relatively restricted, and much of the habitat being rapidly developed, this species disappears if remnant patches lose shrub understorey and ground litter. Was fairly common in King's Park, in Perth, up to 1986, but now rare there. Fires represent a hazard for this thornbill, and fragmentation of habitat could make it more vulnerable to such predators as cats. Although currently considered to be not at risk, the species would benefit from careful monitoring, as it could become threatened.



**Food and Feeding** Premincliptera centipedes (Ciclopoda), spiders (Araneae), beetles (Coleoptera) flies (Diptera), bugs (Hemiptera), bees, wasps and ants (Hymenoptera), moths (Lepidoptera), grasshoppers (Orthoptera), and variety of other arthropods; seeds and vegetable matter also taken. Rarely seen singly. Nominatae face and *rosinae* face in presumed pairs or in small to large parties of up to c. 20 individuals. Males and females are polygamous. Historically, females of *A. rosinae* and *A. rosinae* were seen in non-breeding, feeding, and/or mating groups of *A. rosinae* with large numbers of individuals together over 6-month period. Sometimes in flocks with *A. pusilla*, *A. uruguayensis*.



and *Calamagrostis campestris*. Forages on ground and in low shrubs, sometimes in grey mangrove (*Sonneratia aspera*) formation. All races feed primarily by gleanings, with some salt-bug, active flycatching, and a fall in hole periods. In 25-ha study area in South Australia, three groups each had a foraging range of c. 10 ha of sapphire habitat in non-breeding season.

**Breeding.** Seasonal, but throughout range. Breeds as pair, some suggestion of possible rare co-operative breeding. 5–15 individuals taking food to near a nest with young. Nest globular to phallic, with rimmed entrance (sometimes with a hood) at side near top, made of grass, bark strips and soft plant stems, sometimes sewed, bound with spider web, spider egg sacs and wool, lined with feathers, fur and plant down, size 10–12 × 12–17 tall and 7–6 × 3 cm wide, entrance diameter 3–2–5 × 5 cm, placed 5 cm to 2 m above ground in dense outer foliage or centre of low shrub, mostly sapphire but also saltbush, bluebush or other shrub, occasionally in mulga, race *hedleyi* in dwarf banksia or sheoak, territory often quite large, but less than 1 ha. Clutch 2–4 eggs, usually 3, white, lightly speckled brown or pinkish-brown, come with more at larger end; no information on duration of incubation and fledging periods; chicks brooded by female, fed by both sexes. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Sedentary; in colour-ringing study, individuals highly sedentary within 25-ha study area, with longest movement 600 m.

**Status and Conservation.** Not globally threatened. Localized and uncommon; tends to be rather quiet and inconspicuous in often inaccessible habitat. Thought to have declined in arid inland areas such as NW Nullarbor Plain, where common in 1930s but scarce by 1960s; may have disappeared from around Leigh Creek (South Australia) since early 1900s. Race *hedleyi* listed regionally as "near-threatened", with population estimated at c. 12,000 individuals, and densities in Victoria of 0.7 birds/ha in Little Desert and 2–2.3 birds/ha in Big Desert; adapts well to a habitat mosaic which includes mature and burnt areas, where food sources seem good; a management suggestion in Ngarkat Conservation Park (South Australia) was the provision of a mosaic of burnt habitats to assist conservation of this taxon. Race *rosinae* listed regionally as "Vulnerable", with some loss of restricted sapphire and saltflat habitat to development, saltfields and reclamation; population estimated at fewer than 10,000 individuals, with 3–8 birds/ha in rich sapphire habitat.

**Bibliography.** Anon. (2007a, 2007b), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brooker *et al.* (1979), Christidis & Boles (1994), Collar *et al.* (1994), Emission *et al.* (1987), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), Matthews (1994, 2002), Matthews & Rogers (1997), Mayr & Serventy (1938), Morcombe (2003), Pavey & Joseph (2004), Pizzey *et al.* (2005), Recher & Davis (2000), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Ward & Paton (2004).

## 58. Yellow-rumped Thornbill

*Acanthiza chrysorrhoa*

French: Acantizé à croupion jaune

Spanish: Acantiza Culiguala

German: Gelbbürzel-Dornschnabel

**Other common names:** Yellow-tailed Thornbill, Pallid/Yellow-rumped/Yellow-tailed Acanthiza, Pallid/Yellow-rumped/Yellow-tailed Tit, Pallid/Yellow-rumped/Yellow-tailed Tit-warbler, Yellowtail; Leigh's Acanthiza, Leigh's Tit/Tit-warbler (*leighi*)

**Taxonomy.** *Saxicola chrysorrhoa* Quoy & Gaimard, 1830, King George Sound, Western Australia. Absence from Bass Strait islands suggests that Tasmanian race *leachi* may now be isolated. Geographical variation to some extent clinal, and all three mainland races appear to intergrade. Additional proposed races are *ferdinandi* (WC Australia, also Great Victoria Desert), which evidently belongs to the nominate population; *vanuensis* (coastal SC & SE Australia) and *ridgwayi* (NW Victoria), both considered synonyms of *leighi*; and *pallida* (arid parts of Western Australia) and *mulii* (humid SW Western Australia), both synonymized with nominate. Four subspecies recognized.

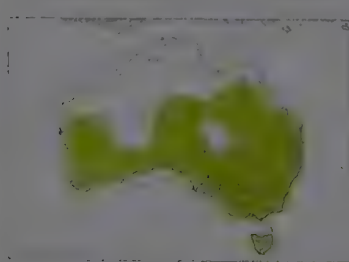
### Subspecies and Distribution.

*A. c. chrysorrhoa* (Quoy & Gaimard, 1830) – C, W, SW & S Western Australia.

*A. c. normantoni* (Mathews, 1913) – C & inland NE Australia.

*A. c. leighi* Ogilvie-Grant, 1909 – S & SE Australia.

*A. c. leachi* Mathews, 1912 – N & E Tasmania.



**Descriptive notes.** 9.5–12 cm; 9 g. A large, distinctive yellow-rumped thornbill with short tail and long slender bill; largest member of genus. Nominative race has forehead blackish, boldly dotted with white, crown to hindneck grey-brown, becoming paler on neck side, merging into cream on throat; whitish supercilium broader in front of eye, extending in narrow pale band just above bill, tapering behind eye, offset by narrow dark eyestripe; ear-coverts off-white, mottled dusky, upperparts grey-brown, uppertail-coverts and uppermost base of tail yellow, contrasting strongly with mainly black tail which has narrow off-white

tips; upperwing grey-brown, blackish alula, dark brown primary coverts and tertial centres, tertials narrow, edged with buff; tip of off-white rump with narrow yellowish line; wing panel, fading with wear; off-white below, variable buff suffusion on breast, richer yellow-brown on flanks, sometimes faint yellow line on underwing-coverts, underwing greyish-black with broad pale greyish-white tip; plumage tends to become paler farther inland; iris variable, yellow-brown to brown; bill and legs black. Sexes alike. Juveniles less well marked than adult, with head spotting duller, light brown fringes of greater coverts may form narrow wingbar. Races differ mainly in plumage tone; *leighi* has shorter tarsus than nominate, plumage darker, more olive above, uppertail-coverts brighter yellow, underparts more buffy, flanks deep buff to yellowish-brown; *normantoni* is like previous but tarsus longer, nape light grey with darker mottling, upperparts paler, rump somewhat brighter olive, uppertail-coverts brighter yellow, underparts mostly bright pale yellow, sometimes dark flecks on upper breast; *leachi* is largest race, darker olive-brown above than others, underside similar to nominate. Voice: Distinctive song a twittering, musical, sweet, high-pitched, quite sibilant, far-carrying trilled cyclic series, sometimes ending with emphatic "swit", often given during foraging and seems to act as a contact signal. Reported as a good mimic, imitates warning call of Noisy Miner (*Manorina melanoccephala*), and calls of *Chthonicola sagittatus* and *Gerygone olivacea*. Soft tinkling "twit, twit, twit" probably also as contact; also has "cheek-cheek", "chip" or "zip" flight call. In Tasmania, race *leachi* tinkling song breeds alone, and it

grasslands. Often in modified habitats such as partly cleared pastures, urban parks and gardens, roadsides and lightly wooded watercourse remnants, recorded also in exotic Monterey pine (*Pinus radiata*) plantations. Mainly lower elevations, to 800 m, and below 400 m in Victoria. Strongly terrestrial, occurring on ground and in shrub layer; in areas of denser habitat, occurs more in open grassy clearings or at edges.

**Food and Feeding.** Primarily arthropods; also seeds. Major prey items include ants (Formicidae), beetles (Coleoptera), bugs (Hemiptera) including termites (Psittidae), also flies (Diptera), cbeekes (Orthoptera), wasps (Hymenoptera), lepidoptera eggs and larvae, and spiders (Araneae), and various other arthropods; seeds and buds taken, with seeds of *Chenopodium alatum* specifically noted. Forages in groups of 3–12 individuals, sometimes up to 30. Behaviour almost like that of a miniature ptilin (*Antalis*), walking on ground in open. Can spend 75–85% of time gleaning on ground at some sites, rest of time in shrub layer, ascends to subcanopy, but rarely above 10 m. Forages from bare ground and leaf litter, also among grass and on fallen wood. Gleans from foliage, under bark and branches, sometimes forages from flowers; occasionally sallies after prey, and observed to hover while taking flies. A core member of mixed-species flocks, often on ground with congeners *A. quoyi* and *A. virgata*; other small insectivores reported in such flocks include Willie Wagtail (*Rhipidura leucophrys*) and Grey Fantail (*Rhipidura albicarpa*), *Pyrrhuloxia brunneus*, *Chthonicola sagittatus*, *A. lineata*, *A. reguloides* and *A. nana*, *Smicronis brevirostris*, *Aphelocoma nigricincta*, Rufous Whistler (*Pachycephala rufiventris*), Petroica robins, Superb Fairy-wren (*Malurus cyaneus*), Striated Pardalote (*Pardalotus striatus*), and Singing (*Lichenostomus virens*) and Brown Honeyeaters (*Lichmera indistincta*).

**Breeding.** Recorded throughout year over extensive range; in all months except Feb and Mar in Western Australia, and Jul–Dec in Tasmania; usually double-brooded, but up to four broods recorded. Breeds as pair, or occasionally co-operatively with 1–3 helpers. Solitary, sometimes in loose groups with inter-nest distance no more than 100 m. Nest built by both sexes, assisted by any helpers present, work completed within 1 week or can be protracted over 2–4 weeks, a bulky and untidy domed structure with side entrance, constructed from dried grass, bark fibres, plant stalks, leaves and rootlets, matted with spider web and/or wool, and with lichen, moss, spider egg sacs or tissue paper attached to exterior, lined with fine grass, fur and hair, feathers and plant down, size varies, 18–30 cm in length (may become much larger as material added), male continues building when female incubating, and continues to do so (often with helpers) even when feeding young; nest may be well insulated for colder weather, and structure loosened for hot season; sometimes one or more cup-shaped, domed or partly domed "false nests" built on top or at side of main chamber, may be utilized for re-nesting (so that clusters of up to five such nests can occur), function of false nest uncertain, suggestions include building practice for helpers, deceiving of predators or cuckoos (Cuculidae), roosting site for male or young fledglings, or simply the result of male's obsessive building urge; nest placed in dense foliage of drooping branches of tree, shrub, vines, grass-tree or mistletoe (Loranthaceae), both native and exotics plants used, particularly eucalypt (32% of 365 records in Nest Record Scheme), acacia (14%), pine (10%) and casuarina (7%), odd sites having included old bucket, pigsty, straw stack, hole in roadside bank, and thick dead-leaf cluster 60 cm above ground in felled eucalypt; often built lower (rarely, within) stick nest of rapier or corvid, also of Australasian babbler (*Pomatostomus*), butcherbird (*Cracticus*) or currawong (*Screepa*); will breed within colonies of Zebra Finch (*Taeniopygia guttata*) and may take over and adapt old nest of that species, also recorded as nesting against nests of communal spider (*Badumna commutata*) in same way as does *A. reguloides*, nest sometimes reused, and same site may be used in several successive years. Clutch 2–5 eggs, usually 3–4, often laid at 48-hour intervals, pure white to pale pink, sometimes dotted with red or red-brown flecks over large end; incubation by breeding female, period usually 16–18 days, most eggs hatch within same day, chicks fed by both sexes and by any helpers present, fledging period 17–21 days. Nests parasitized by Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*), e.g. at one site, of 135 nests over four years, 35 (26%) were parasitized by Shining Bronze-Cuckoos; parasitized nests may be sealed and abandoned, or new nest built on the old one. Of 1056 eggs in 333 nests, 586 hatched (55.5%) and 385 (33.9%) produced fledglings, equivalent to 1.07 young per nest; predation rate high, c. 58% in some studies, predators including corvids, currawongs, Australasian babblers, Red Wattlebird (*Anthochaera carunculata*) and Australian Magpie (*Gymnorhina tibicen*); also, honeyeaters may destroy nest to acquire nesting material, as also may Silvereyes (*Zosterops lateralis*) and others of present species. Longevity in ringing studies more than 9 years 6 months.

**Movements.** Primarily resident; some local movements reported, with autumn–winter occurrences at some sites. Of 843 recoveries of 630 individuals, 841 (99.8%) were less than 10 km from ringing site and two (0.2%) at 10–49 km.

**Status and Conservation.** Not globally threatened. Widespread and common over large area of mainland Australia and Tasmania. Has adapted to modified habitats. Declines noted around major cities, such as Adelaide, Sydney and Melbourne, presumably correlated with loss and degradation of habitat and increased levels of predation; similarly, populations in wheatbelt of SW Western Australia have declined. In general, however, this species' future seems to be secure, at least in the medium term.

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Brown & Brown (1982, 1986), Campbell (1925, 1936), Christidis & Boles (1994), Courtney & Marchant (1971), Emission *et al.* (1987), Ford *et al.* (1986), Garnett & Crowley (2000), Green (1989), Hall (1974a), Higgins & Peter (2002), Lord (1953), Mayr & Serventy (1938), McGill (1970), Morcombe (2003), Nicholls *et al.* (2000), North (1904), Pizzey *et al.* (2005), Ratkovsky & Ratkovsky (1980), Recher & Davis (1998), Saunders & Ingram (1995), Schodde & Mason (1999), Serventy & Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003), Watts (2002).

## 59. Yellow Thornbill

*Acanthiza nana*

French: Acantizé nain

German: Gelbbüch-Dornschnabel

Spanish: Acantiza Inana

**Other common names:** Little Yellow-breasted Thornbill, Little Mathews's Yellow Tit, Yellow-breasted Titmit

**Taxonomy.** *Acanthiza nana* Vigors & Horsfield, 1827, Parramatta, New South Wales, Australia. Nominative race and *modesta* intergrade; in addition latter race varies clinally, generally becoming paler from S to N. Three subspecies recognized.

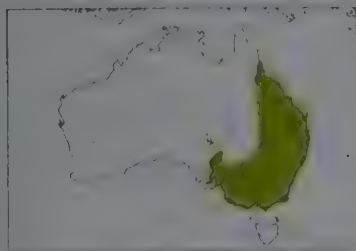
### Subspecies and Distribution.

*A. n. flaviventris* L. White, 1922 – NE Queensland (Atherton and Evelyn uplands), in NE Australia.

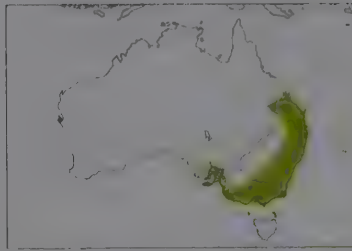
*A. n. modesta* De Vis, 1905 – SE Queensland S inland (W of Great Dividing Range) to SE South Australia and Victoria.

*A. n. nana* Vigors & Horsfield, 1827 – coastal and subcoastal SE Australia (extreme SE Queensland S to SE New South Wales).





**Descriptive notes.** 8.5–10 cm; 6–7 g. Small to medium-sized thornbill, the yellowest of the genus. Nominative race has forehead to hindneck olive to dull yellowish-olive (greyer when plumage worn), lores pale, narrow pale eyering (clearest at bottom of eye), ear-coverts with dense buffish-yellow brush-like streaks sometimes hint of yellowish supercilium behind eye; upperparts olive, slightly brighter on rump, yellower uppertail-coverts; uppertail brownish-olive, outer edges of rectrices yellowish, broad blackish subterminal band and olive tip; upperwing-coverts with yellow-olive fringes, outer greater coverts sometimes tipped white,



white streaks on crown and through face to ear-coverts; lores dark grey, prominent broad off-white supercilium tapering to thin streak over ear-coverts (pale-faced appearance); upperparts dull greenish-olive, merging to browner uppertail-coverts; uppertail olive-brown with blackish subterminal band, rectrices with yellowish outer edges, outermost with whitish outer edge; primaries edged pale olive-yellow, shading to off-white on basal area of outer primaries (diffuse pale primary strip); chin, throat and malar area off-white, streaked blackish, breast off-white, fading to dull yellow at side, and well streaked

fine pale edges of primaries forming pale wingpanel, contrasting with darker primary coverts and alula; chin, throat and malar area pale orange-buff, underparts yellow to bright yellowish-olive, dull yellow-olive wash on breast side, undertail-coverts yellow; undertail brownish-grey with broad blackish subterminal band; iris dark brown to red-brown; bill and legs black. Differs from superficially similar *Smicrorhynchus brevirostris* in larger size, much finer and often darker bill. Sexes alike. Juvenile is duller than adult, browner on mantle, paler yellow below. Races vary mainly in minor details of measurement and plumage: *flava* is similar to nominate but longer-tailed, brighter in coloration, tinged yellow above, bright yellow below, orange-buff on upper breast; *modesta* is greyer above than others, some with brownish wash on forehead, ear-covert streaks whitish, throat darker orange-buff, underparts creamy yellow, faint olive wash on breast and flanks. **Voice.** A repeated disyllabic "tizi-id" or "tizi-id, tizi-tizi", rather less insect-like than that of *A. lineata*, more like call of *Smicrorhynchus brevirostris*, given throughout day; seems to be contact call, but possibly also for territorial advertising or defence.

**Habitat.** Open forest, and shrublands in drier woodland. Inhabits casuarina (*Casuarina*), cypress pine (*Callitris*), acacias (*Acacia*) such as mulga and brigalow, paperbark (*Melaleuca*), and some eucalypts (*Eucalyptus*), including mallee and box-ironbark. Avoids rainforest, except locally in parts of New South Wales, where found in dry monsoon rainforest and tall closed subtropical rainforest; also in coastal mangrove. Quite frequent in drier wooded shrubby parks and gardens, sometimes in exotic Monterey pine (*Pinus radiata*) plantations and orchards.

**Food and Feeding.** Major prey items include ants and wasps (Hymenoptera), beetles (Coleoptera), bugs (Hemiptera) including lerps (Psyllidae), flies (Diptera), also crickets (Orthoptera), lepidoptera, eggs and larvae, cockroaches (Blattodea), spiders (Araneae), and assorted other arthropods; some records also taken. Usually in small parties of 3–5 individuals, sometimes up to ten, and flocks with as many as 35 recorded; also singly and in presumed pairs. Almost exclusively arboreal, rarely on ground, usually in canopy and subcanopy; uses wide variety of trees and shrubs, but particularly acacia, native pine, casuarinas and paperbarks; reported as seeming to forage lower in autumn and winter than in spring and summer, using shrub layer more in winter. Forages primarily in foliage but also on bark, by gleaning, and with some aerial sallying. In South Australia recorded in mixed thornbill flocks of up to 100 or more individuals, along with *A. chrysorrhoa*, *A. reguloides* and *A. uropygialis*, large numbers of Silvereyes (*Zosterops lateralis*) sometimes joining the flock; joins mixed flocks with *Smicrorhynchus brevirostris*, Striated Pardalote (*Pardalotus striatus*) and *A. reguloides*.

**Breeding.** Season Jul–Mar (spring, summer and autumn) throughout range; sometimes double-brooded. Breeds solitarily as pair; sometimes co-operatively with helpers at nest. Nest built by both sexes, a rounded oval or nearly spherical structure with narrow entrance near top, sometimes with loose hood over aperture, made from thin bark strips and fibres and fine grasses, matted with spider web and decorated with spider egg sacs, lichen or green moss, lined with fine dry grass, feathers, fur, wool or white silky down from seed pods or thistles, exterior may be largely bark strips, or green moss or covered with spider egg sacs, size 9–15 cm long and 5–8 cm wide, entrance diameter 2–5 cm; sited in thin leafy twigs or leaves in upper branches of shrub or small tree, sometimes fork in branch (of 74 nests in Nest Record Scheme, 33.8% in eucalypt, 8.1% in acacia and 8.1% in native pine), rarely in grass tussock, height variable, 2–12 m, sometimes to 17 m (average 6.6 m); will reuse nest for second brood. Clutch 3 or 4 eggs, sometimes 2, laid at 2-day intervals, white, finely freckled and blotched with dark, sometimes forming zone at larger end; incubation period estimated at 16–17 days; chicks fed by both parents, also by helpers if present, no information on duration of nestling period. Nests parasitized by Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Success of 22 nests, 13 (59.1%) produced at least one fledged young. Longevity in ringing studies at least 11 years 11 months.

**Movements.** Primarily resident; some local movements reported, with autumn–winter post-breeding occurrences at some sites, moving into wider range of habitats. Of 389 recoveries of 278 individuals, all were less than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Widespread and locally common. Race *flava* of far N Queensland poorly known, and occupies fairly limited range. This species suffers locally from degradation of woodland habitats and creeping suburbanization. Probably secure in most of range.

**Bibliography.** Atten (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Beraldo *et al.* (2003), Blakers *et al.* (1984), Campbell (1926, 1936), Christian & Boies (1994), Emerson *et al.* (1988), Gammie & Coad (2000), Higgins & Peck (2002), Ford (1956a, May & Nelson, 1938), May (1970), May (1971), May (1972), May (1973), May (1974), May (1975), May (1976), May (1977), May (1978), May (1979), May (1980), May (1981), May (1982), May (1983), May (1984), May (1985), May (1986), May (1987), May (1988), May (1989), May (1990), May (1991), May (1992), May (1993), May (1994), May (1995), May (1996), May (1997), May (1998), May (1999), May (2000), May (2001), May (2002), May (2003), May (2004), May (2005), Recher (1989), Recher & Majer (1994), Ris (1976), Schodde & Mason (1999), Serventy *et al.* (1982), Serventy *et al.* (1983).

## 60. Striated Thornbill

### *Acanthiza lineata*

**French:** Acanthize ridé **German:** Stricheldornschnabel **Spanish:** Acanthiza latriada  
**Other common names:** Stripe-crowned Thornbill/Tit-warbler, Green/Striated/Striped Tit/Tit-warbler

**Taxonomy.** *Acanthiza lineata* Gould, 1838. Sydney, New South Wales, Australia. Races: intergrade. Proposed race *chandleri* (central SE South Australia and Victoria) synonymized with nominate. Four subspecies recognized.

#### Subspecies and Distribution.

- A. l. alberti* Mathews, 1920. SE Queensland and extreme NE New South Wales, in 1 Australia.
- A. l. lineata* Gould, 1838. SE New South Wales, SE Victoria.
- A. l. chandleri* Mathews, 1912. SE South Australia and SW Victoria.
- A. l. alberti* Mathews, 1912. Kangaroo I., SE South Australia.

**Descriptive notes.** 9–11 cm, 7 g. Distinctive thornbill, with well-streaked head and forehead. Nominative race has top of head tan-brown, becoming paler on neck side and hindneck, with dense

with blackish, belly and vent off-white or pale yellow, upper belly sometimes diffusely streaked blackish, flanks greyish-olive and merging to yellow-brown at rear, undertail-coverts pale buff; undertail brownish-grey with narrow dusky subterminal band; iris brown or grey-brown; bill dark grey to black, paler base of lower mandible; legs variably grey-black to dark brown. Sexes alike. Juvenile is similar to adult but duller, with less obvious streaking. Races all very similar, differ in minor plumage and measurement details: *alberti* is similar to nominate but has shorter wing, tail, bill and tarsus, paler head, ear-coverts less boldly streaked, brighter olive upperparts, fainter and less dark (dark brown) chin and throat streaking, finer and dark brown breast streaking, much brighter yellow belly, more richly coloured flanks; *chandleri* is very like nominate but shorter wing, tail, bill and tarsus, somewhat paler head with slightly clearer white streaks, brighter (light olive) upperparts, generally slightly less bold breast streaking; *whitei* is also very like nominate but has longer tarsus, slightly paler top of head, duller upperparts, less yellowish underparts. **Voice.** Vocal. Constant thin, high-pitched, raspy, almost insect-like "tizi-tizi" calls as it forages; similar "zit" or "zip" can be given singly, several times or repeated monotonously; rapid twittering by small flocks when about to fly away. Song reported as beautiful, short and sweet; also gives quiet very high trill in spring.

**Habitat.** Primarily eucalypt (*Eucalyptus*) forests and woodlands with good shrub layer, including mallee and riparian formations, also paperbarks (*Melaleuca*), mallee shrublands, and sometimes rainforest and dense thickets. Particularly fond of tall forest. Occurs in agricultural land with scattered gums and remnant vegetation, also on forest edges; sometimes in gardens in suburban areas, but needs mature formations. Usually avoids exotic pine (*Pinus*) plantations. Formerly recorded in mangroves near Sydney. From coast across Great Dividing Range to edge of semi-arid inland, from sea-level to subalpine areas.

**Food and Feeding.** Prey includes spiders (Araneae), insect larvae, beetles (Coleoptera), flies (Diptera), bugs (Hemiptera) including lerps (Psyllidae), also ants and wasps (Hymenoptera) and various other arthropods; seeds recorded include those of chenopods, acacia (*Acacia*), *Rubus*; also takes manna secreted by lerps (see page 557) on manna gum (*Eucalyptus viminalis*) and nectar from *Acacia* and *Grevillea*. Sociable, often in groups of three or four individuals or in clans of up to 20 or more; these disperse into pairs or small groups in breeding season. Forages to great heights in subcanopy and canopy, but can be seen at all levels, including ground; in autumn and winter may forage lower in some areas but higher in others, this probably related to flowering of mountain gum (*Eucalyptus dalrympleana*), which may attract insects or possibly provide nectar. Food obtained mainly by gleaning and by hanging in foliage; sometimes probes under bark, also sallies for insects. A core member of mixed-species flocks, particularly in winter, with *A. pusilla* and *A. reguloides*, *Smicrorhynchus brevirostris*, Varied Sittella (*Daphoenositta chrysoptera*), Petroica robins and a variety of other small insectivores. In New South Wales study, clans maintained a non-breeding home range of 5–9 ha, which they defended aggressively against other clans, and kept over different years (although size altered as clan size changed); these winter clan territories are divided among the constituent groups in breeding season.

**Breeding.** Season Jun–Mar, with eggs Jun–Dec; likely to be occasionally double-brooded. Breeds as simple pair or as co-operative group of three or four individuals (group size increasing to 4–8, probably as fledged young join). Group seems to hold same territory each year (one group for four successive years); aggressive interactions with honeyeaters (Meliphagidae) well known, some involving defence of feeding site, as with Red Wattlebird (*Anthochaera carunculata*), and others involving semi-colonial honeyeaters such as Bell (*Manorina melanophrys*) and Noisy Miners (*Manorina melanoleuca*), Fuscous (*Lichenostomus fuscus*) and White-naped Honeyeaters (*Meliphaga lunata*), which may try to exclude present species over lengthy period, perhaps in defence of food resources. Nest built by both sexes, role of helpers uncertain, oval or pear-shaped and domed, with partly hooded side entrance near top, made of bark shreds interwoven with fine grass, green moss, lichen and large amounts of spider web and spider egg sacs, inner wall and base made of soft inner bark fibre, lined with feathers, fur, hair or plant down, white material (e.g. thread, white bark, wool, tissue paper) often used on exterior, outer nest layer can be thick and matted and looks as if it could be peeled off, nest size 7.6–10.2 cm wide and 10.2–12.7 cm long, entrance diameter 1.9–2.5 cm; placed usually 3–6 m above ground in foliage of outer branches of tree, shrub or sapling (eucalypts favoured), sometimes in grass tussock. Clutch 2–4 eggs, usually 3, laid every second day, pinkish-white to pale creamy buff with dark spots and streaking, forming zone around larger end; incubation by female alone, period 11–17 days; chicks fed by both adults and by any helpers present, nestling period 18–20 days; all members of group feed fledglings, and young remain with group until following breeding season. Nests parasitized by Fantailed Cuckoo (*Cacomantis flabelliformis*), Shining Bronze-cuckoo (*Chrysococcyx lucidus*) and Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Of 238 eggs in 82 nests, 109 (45.8%) hatched and 62 (26%) produced fledglings, equivalent to 0.76 young per nest; co-operative groups often have greater breeding success than simple pairs. Longevity in ringing studies more than 15 years 7 months.

**Movements.** Primarily resident; some local movements. In SE New South Wales, moves out of higher altitudes (above 1530 m) of Snowy Mts when snow-covered, possibly to lower elevations in Brindabella Range, near Canberra. Local wandering also reported; perhaps winter visitor to part of S Queensland, and some may move away from drought-afflicted areas. Of 3060 recoveries of 1624 individuals, all were from less than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Common and widespread over much of SE mainland, also on Kangaroo I. In Victoria study, density varied from 62 group territories/km<sup>2</sup> in regrowth to 28/km<sup>2</sup> in mature forest (optimal habitat), and 37–69 in mountain ash (*Eucalyptus regnans*) forest not burnt 50 years ago. Vulnerable to fire, logging, and land clearance or modification for development, also susceptible to destruction of mature habitat caused by eucalypt dieback disease.

**Bibliography.** Atten (1999b, 2007a, 2007b, 2007c), Barrett *et al.* (2003), Bell & Ford (1986), Beraldo *et al.* (2003), Blakers *et al.* (1984), Campbell (1926, 1936), Christian & Boies (1994), Emerson *et al.* (1988), Gammie & Coad (2000), Higgins & Peck (2002), Ford (1956a, May & Nelson, 1938), May (1970), May (1971), May (1972), May (1973), May (1974), May (1975), May (1976), May (1977), May (1978), May (1979), May (1980), May (1981), May (1982), May (1983), May (1984), May (1985), May (1986), May (1987), May (1988), May (1989), May (1990), May (1991), May (1992), May (1993), May (1994), May (1995), May (1996), May (1997), May (1998), May (1999), May (2000), May (2001), May (2002), May (2003), May (2004), May (2005), Recher (1989), Recher & Majer (1994), Ris (1976), Schodde & Mason (1999), Serventy *et al.* (1982), Serventy *et al.* (1983).



(2001), North (1904), Osborne & Green (1992), Pizzey *et al.* (2005), Recher (1989), Recher & Majer (1994), Recher *et al.* (1987), Schodde & Mason (1999), Serventy *et al.* (1982), Slater, P. *et al.* (2003), Slater, P.J. (1995).

## Genus *APHELOCEPHALA* Oberholser, 1899

### 61. Southern Whiteface

#### *Aphelocephala leucopsis*

French: G rygone blanch tre

Spanish: Cariblanco Meridional

German: Fahrtr cken-We st rnchen

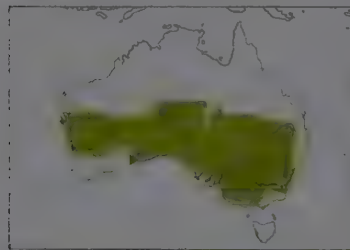
**Other common names:** (Common/Central Australian) Whiteface, White-faced Squeaker/Titmouse; Eastern Whiteface (*leucopsis*); Chestnut-bellied/(Western) Pallid Whiteface (*castaneiventris*)

**Taxonomy.** *Xerophila leucopsis* Gould 1841, Adelaide and central Mount Lofty Ranges, South Australia. Races probably intergrade in SE Western Australia, but circumstances poorly known. Paler birds from SC Australia (S Northern Territory, NW South Australia and adjacent Western Australia) included in nominate, but sometimes considered to represent an additional race (*whitei*). Two subspecies presently recognized.

**Subspecies and Distribution.**

*A. l. castaneiventris* (Milligan, 1903) – C Western Australia.

*A. l. leucopsis* (Gould, 1841) – SE Western Australia E to S Queensland, inland E New South Wales and Victoria.



**Descriptive notes.** 10.5–12.5 cm; 12–5 g. Largely terrestrial tubby, short-tailed, stout-billed acanthizid. Nominative race is brown-grey to grey-brown above, with prominent off-white face margined with black on upper edge, fine black line from centre of forehead to bill; tail blackish, tipped white; flight-feathers dark brown; creamy white or light fawn below, grey wash across breast, brown-grey wash on flanks; iris cream or creamy yellow; bill black or grey-black; legs dusky brown to grey-black. Sexes alike. Juvenile similar but less well marked, lacks blackish facial band, has light brown fringes on upperwing-coverts. Race

*castaneiventris* differs from nominate mainly in having rufous flanks, also in whiter face and paler plumage, rump sometimes tinged light rufous-brown, and usually fainter brownish-grey wash on sides of breast. Voice. Often very vocal, giving persistent sibilant trilling series not unlike that of a fairy-wren (*Malurus*) but louder. Also a harsh, rather *Sericornis*-like scolding chatter, and “wit, wit-awit” flight call. Calls of race *castaneiventris* distinct, being quieter, less robust, slightly more sibilant and less vigorous.

**Habitat.** Arid and semi-arid acacia (*Acacia*) and eucalypt (*Eucalyptus*) woodland and shrubland, especially mulga, also mallee, with understorey of grass and low shrubs, especially saltbush (*Atriplex*) and bluebush (*Maireana*), and *Eremophila*. Sometimes in cypress pine (*Callitris*) woodland and shrubland. Availability of holes in trees important for nesting. Extends to coastal areas and in W to subtropical zone, occurring in hills, ranges, lowlands and plains, especially dunes, swales and floodplains.

**Food and Feeding.** Primarily arthropods, also seeds and leaves. Arthropod prey mainly insects, includes beetles (Coleoptera), lepidopteran larvae, ants (Formicidae), bugs (Hemiptera) e.g. aphids (Aphididae) and shield-bugs (Pentatomidae), orthopterans, flies (Diptera) and wasps (Hymenoptera); seeds commonly taken include those of genera *Erodium*, *Euphorbia*, *Marrubium*, *Panicum*, *Pharbitidis* and *Trifolium*. Usually in pairs or small parties of 3–8 individuals, sometimes in larger loose flocks of up to 60. Forages mainly on ground, sometimes in small trees and shrubs, often in bare areas or in sparse vegetation at base of trees, shrubs or bushes. Probes under bark on dead limbs. Frequent member of feeding flocks including congeners *A. pectoralis* and *A. nigricincta* and *Pyrrholaemus brunneus*, but more usually *Acanthiza* species, Red-capped Robin (*Petroica goodenovii*), Rufous Whistler (*Pachycephala rufiventris*), Willie Wagtail (*Rhipidura leucophrys*) and Bl. and W. Warblers (*Lanius cinereus*).

**Breeding.** Recorded in all months, mostly Jul–Nov and Mar–Apr; may rear several broods in a season. Nests usually as pair, but communal and co-operative breeding also known and may be widespread. Nest a bulky domed structure with entrance in side or top, sometimes with hood, made of soft bark, grass, rootlets, fur, feathers, wool, sticks and twigs, also soft flowers, spider web, moss, dead leaves and string or cloth, often lined with feathers, fur or wool, placed usually in hole or crevice in tree, bush, fence post or building, highly opportunistic, will use man-made artefacts (e.g. tin, clothing), and even a bullock skull recorded as used. Clutch 2–6 eggs, usually 3 or 4, white to light buff or tinged pinkish, thickly spotted and irregularly blotched with brown to reddish, markings usually concentrated at large end; no definite information on incubation period, allegedly c. 22 days at one nest but this disputed; chicks fed by both adults, also by any helpers present, nestling period more than 19 days. Nests parasitized by Horsfield’s Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Locally resident; some local drought-related movements, to wetter areas not normally occupied.

**Status and Conservation.** Not globally threatened. Locally fairly common; rather patchily distributed. Has declined in many areas; reasons unknown, but probably related to habitat degradation and loss of nesting hollows, also land clearance and, locally, high density of predators such as feral cats and rats (*Rattus*).

**Bibliography.** Anon. (1999b, 2007a, 2007b, 2007c), Barker & Vestjens (1990), Barrett *et al.* (2003), Blakers *et al.* (1984), Chisholm (1938), Garnett & Crowley (2000), Gibson (1977), Hall (1974a), Higgins & Peter (2002), Matfield (1999), Pizzey *et al.* (2005), Schodde & Mason (1999), Serventy *et al.* (1982), Slater *et al.* (2003), Whittell (1976), Serventy *et al.* (1982), Slater *et al.* (2003).

### 62. Chestnut-breasted Whiteface

#### *Aphelocephala pectoralis*

French: G rygone   collier roux

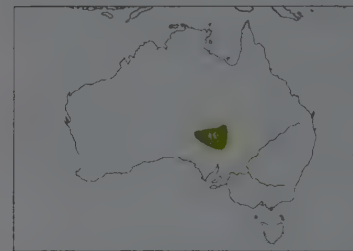
Spanish: Cariblanco Pectoral

German: Braunbrust-We st rnchen

**Other common names:** Chestnut breasted Whiteface/Tit

**Taxonomy.** *Xerophila pectoralis* Gould, 1871, Port Augusta, South Australia. Monotypic.

**Distribution.** C South Australia (centred around Mt Lyndhurst, Oodnadatta and Coober Pedy).



**Descriptive notes.** 9–10.5 cm; 9 g. Has entire facial area off-white, narrowly bordered black along upper edge, thin black line from centre of forehead to bill, indistinct short thin dusky streak behind eye; crown to neck and ear-coverts greyish, fine dusky streaking on crown, dusky mottling on ear-coverts; upperparts rufous-brown; tail black, merging to pale brown at base, narrow white tips on all except central rectrices, narrow white edge on outer feathers; upperwing black-brown, pale bar across greater coverts; white below, broad pale chestnut breastband merging into white throat but clearly demarcated from white belly (breastband varies, sometimes paler and with narrow and irregular black blotching along lower edge), flanks heavily blotched chestnut; iris creamy, sometimes with faint bluish tinge; bill and legs grey-black to black. Sexes alike. Juvenile has less distinct facial pattern than adult, lacking black border, also much paler and less distinct breastband and flank markings, iris bluish-grey, pinkish-brown base of lower mandible. Voice. Song based on rising “sweet” phrases. Thin musical, trilling, twittering sound often given in flight; soft insect-like ticking seems to be a contact call. Calls weaker and softer than those of congeners.

**Habitat.** Chenopod shrublands in open stony desert and semi-arid areas, often on stony hills or rises and gibber tablelands; has liking for patchy cover of bluebush (*Maireana*), *Eremophila* and saltbush (*Atriplex*). Avoids more vegetated creeklines.

**Food and Feeding.** Arthropods and seeds. Arthropods include beetles (Coleoptera, including genera *Foramicomus* and *Polyphrades*), lepidopteran larvae, wasps (Hymenoptera), orthopterans, and pentatomid bugs; seeds eaten include those of genera *Panicum*, *Setaria*, *Euphorbia*, *Sida* and *Portulaca*. Forages in twos (probably pairs) or in small flocks of 5–7 individuals, occasionally up to 12. Feeds on ground. Occasionally occurs together with both congeners in one flock; forages with either or both in areas where tree-lined watercourses lie alongside gibber-chenopod habitats, and also forages with *A. nigricincta* in or near sandy areas, and on gravel of mine-tailings on arid hillside. Associates with Cinnamon Quail-thrush (*Cinclosoma cinnamomeum*). Often wary, may fly long distances when disturbed, perching up on bushes, before dropping to resume feeding; can also be confiding.

**Breeding.** Poorly known. Recorded in Aug–Sept. Performs display-flights, also sings after rains when breeding. Globular nest, with entrance “spout” or hole at side near top, made of twigs, or twigs and grass, lined with wool, fur, soft plant material or fine feathers, sited low in small shrub, often bluebush. Clutch 2–4 eggs, pale pinkish with darker purple-grey markings; nestlings fed by both parents; no information on incubation and nestling periods.

**Movements.** Resident; numbers fluctuate according to local conditions and severity of drought.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in South Australian Desert Secondary Area. Rare to scarce. Confined to a small area of arid South Australia; reported occurrence in adjacent Northern Territory unconfirmed. Vulnerable to overgrazing and severe drought. Some significant areas of habitat have been destroyed by opal-mining operations.

**Bibliography.** Anon. (1999b, 2006a, 2007c), Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Buichart & Stattersfield (2004), Christidis & Boles (1994), Garnett (1993), Garnett & Crowley (2000), Higgins & Peter (2002), Pedler (1990, 1991, 1992), Pizzey *et al.* (2005), Ragless (1969), Schodde & Mason (1999), Schodde & Tideman (1990), Slater *et al.* (2003), Stattersfield & Capper (2000), Thomas & Thomas (1996).

### 63. Banded Whiteface

#### *Aphelocephala nigricincta*

French: G rygone   collier noir

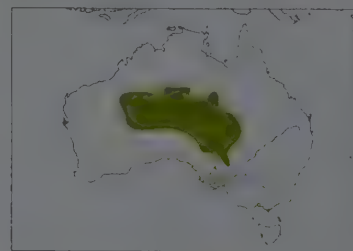
German: Halsband-We st rnchen

Spanish: Cariblanco Bandeado

**Other common names:** Black-banded Squeaker/Whiteface

**Taxonomy.** *Xerophila nigricincta* North, 1895, Missionary Plain, central Australia. Monotypic.

**Distribution.** Arid inland Australia, mostly in Western Australia, S Northern Territory and N & NE South Australia.



**Descriptive notes.** 9–10 cm; 11 g. Has whitish face (tinged cream in fresh plumage), chin and throat, narrow black forehead band along upper edge and extending down through eye on to greyish-brown ear-coverts, thin blackish line from forehead to bill, indistinct short dusky streak behind eye; crown light brown, finely streaked grey grading to light chestnut-brown on nape, hindneck and side of neck; upperparts warm chestnut-brown, grading to dark chestnut on rump and scapulars, with clear white margins on tertials and upperwing-coverts; tail black, shading to brown at base, all rectrices except central pair having narrow white outer edge and broad white tip; creamy white below, narrow chestnut to buff wash on sides of upper breast sometimes grading to pale rufous-brown mid-body, narrow black band on lower breast (narrowest in centre), rest of underparts white, with rich rufous blotching on flanks, iris white or cream; bill black or grey-black; legs grey-black. Sexes alike. Juvenile is like a paler version of adult, with less distinct face pattern, duller breastband (may be broken), duller rufous flank blotches. Voice.

Song, from perch and in flight, a quite loud, pleasant, sweet, musical trilling series, stronger and sweeter than that of *A. pectoralis*. Also a piping “pee pee pee” and rapid piping “tri-tri-tri-tri”; harsh cricket-like “be-be-be” alarm call.

**Habitat.** Open shrublands and grasslands in arid and semi-arid areas. Inhabits sandy and stony hills and plains with scattered vegetation, including mulga (*Acacia*), bluebush (*Maireana*), saltbush (*Atriplex*), *Eremophila*, *Cassia* and *Yucca*; also locally in spinifex (*Triodia*). Frequent burn and flood areas.

**Food and Feeding.** Little information available. Takes insects; also seeds, including those of *Setaria viridis*. Generally forages in pairs or in small flocks of up to ten individuals; flocks more common in non-breeding season. Forages on ground, sometimes in low trees and shrubs. Joins flocks with either or both of its congeners, also with *Acanthiza chrysorrhoa* and Crimson Chat (*Epthianura tricolor*).

**Breeding.** Recorded in Feb–Oct, also opportunistically in Dec–Jan after heavy rain. In display-flight, rises into air and then descends at 45° angle, with wings spread and flapping slowly; displays and will sing from top of shrub after rain. Nest bulky, oval or spherical, with side entrance tunnel, made of sticks, twigs, plant stems and grass, lined with feathers, fur and spider web, sited low in shrub or small tree, often in prickly shrub (including mulga and other acacias and *Salsola*

*kali*), in open grassland or shrubland. Clutch 1–4 eggs, usually 2–3, white to brownish-white, variably spotted (and occasionally blotched) with dull reddish to grey; no information available on incubation and fledging periods. Nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*).

**Movements.** Poorly known; local nomadism in response to rainfall seems plausible.

**Status and Conservation.** Not globally threatened. Uncommon. Occurs at rather low density over huge tracts of remote arid and semi-arid zones. No obvious threats.

**Bibliography.** Barrett *et al.* (2003), Beruldsen (2003), Blakers *et al.* (1984), Ford (1974b), Ford & Parker (1974), Garnett & Crowley (2000), Hall (1974a), Higgins & Peter (2002), North (1904), Pedler (1992), Pizzey *et al.* (2005), Schodde & Mason (1999), Schodde & Tideman (1990), Slater *et al.* (2003), Wilson (1974).



Class AVES  
Order PASSERIFORMES  
Suborder OSCINES

## Family EPTHIANURIDAE (AUSTRALIAN CHATS)



- Small passerines with rotund body, short, broad and rounded wings, shortish tail with squarish or slightly rounded tip, short slender bill generally straight, fairly long and thin legs and rather weak feet; plumage mostly quite bright, male of one species with much red.
- 11–14 cm.



- Australia
- Low shrubs and other vegetation, mostly in arid and semi-arid areas.
- 2 genera, 5 species, 7 taxa.
- No species threatened; none extinct since 1600.

### Systematics

Australian chats are small, largely insectivorous terrestrial passerines endemic to Australia. Their relationships have been discussed by various authors, and they have in the past been placed with the thornbills in the family Acanthizidae. The majority of modern taxonomists, however, consider them to be close to the honeyeaters (Meliphagidae). Indeed, many current workers place the Australian chats in Meliphagidae, within which some consider them to form a subfamily, Epthianurinae. A number of other taxonomists have preferred to recognize the morphological and physiological adaptations of Australian chats to arid and semi-arid environments, and have therefore followed earlier treatments in considering them a distinct family, Epthianuridae. This last treatment does at least have the advantage of drawing greater attention to these rather interesting birds.

As presently treated, the family Epthianuridae comprises five species in two genera, *Epthianura* and *Ashbyia*. The Crimson Chat (*Epthianura tricolor*) and the Orange Chat (*Epthianura aurifrons*) occur mostly in arid and semi-arid regions of central and southern Australia, and the Yellow Chat (*Epthianura crocea*) is found at scattered sites in tropical northern Australia and arid regions of central Australia. The White-fronted Chat (*Epthianura albifrons*) inhabits various zones across southern Australia and is the only member of the family present in Tasmania. The Gibberbird (*Ashbyia lovensis*) occurs only in arid central Australia.

Despite the English vernacular name, the Australian chats are not related to the Old World chats of the tribe Saxicolini, which are part of the thrush family (Turdidae). The term "chat" may be an allusion to the epthianurids' ground-dwelling habits and rather robust body, which are not unlike those of such saxicolines as the wheatears (*Oenanthe*). Other common names often applied to various species include "nun", "tang", which probably refers to the call given by some members of the family, and "canary", which is presumably a reflection of the bright red or orange colours of the Crimson and Orange Chats).

Close affinities between the Australian chats and the honeyeaters were first suggested by morphological studies, particularly observations by S. A. Parker which confirmed that both groups had a brush-tipped tongue. Analysis of egg-white proteins appeared to support such a relationship. Studies by C. G. Sibley and J. E. Ahlquist, using DNA-DNA hybridization, added further support to the theory that Australian chats are in fact honeyeaters, and this was later corroborated by L. Christidis and

R. Schodde, who analysed allozyme (protein) variation. A more recent study, involving the sequencing of mitochondrial and nuclear DNA, has provided additional compelling evidence to show that Australian chats are nested deep within the family Meliphagidae. The DNA-sequence data indicate that the Australian chats form one of three separate groups within a poorly resolved clade. The second group comprises the largely northern Australian honeyeater genera *Conopophila* and *Ramsayornis*, and the third group consists of the New Guinean endemic genera *Melilestes*, *Melipotes* and *Timeliopsis*. Unfortunately, the DNA data shed little light on the evolutionary and phylogenetic relationships among these three groups.



The five species of Australian chat are endemic to Australia. Sometimes placed with the thornbills in Acanthizidae, there is growing consensus that they are most closely related to honeyeaters (Meliphagidae). This link is corroborated by studies of egg-white protein, DNA and allozymes, as well as shared morphological features, including a brush-tipped tongue, though this is vestigial in the chats. Males tend to be strikingly patterned or brightly coloured. In summer plumage, for example, the male **Yellow Chat** is vivid yellow with black lores and a distinctive black crescent on the upper breast.

[*Epthianura crocea crocea*, Roebuck Plains, Western Australia, Australia.  
Photo: Ian Montgomery]

Australian chats are small semi-terrestrial passerines with relatively long legs and an upright stance. In this regard they are vaguely reminiscent of wheatears (*Oenanthe*). All five species occur in open or lightly wooded country, where they are seen mainly on the ground, walking jerkily, or in low bushes. They are all well adapted to arid environments, particularly the **Gibberbird**, which lives in some of the driest regions of Australia. It typically inhabits stony gibber plains with a sparse cover of saltbush (*Atriplex*) and other low shrubs, grasses and herbs. Unlike most Australian chats, it is quite difficult to find because of its cryptic coloration.

[*Ashbyia lovensis*,  
Birdsville District,  
Australia.

Photo: Ian Montgomery]



Most taxonomic lists place the Australian chats at the end of the honeyeaters, starting with the Crimson Chat. Some authors consider the Crimson Chat to be most closely related to honeyeaters on the basis of external morphology, and the recent genetic data largely support this hypothesis. The sequence usually continues with the Orange, Yellow and White-fronted Chats, followed by the Gibberbird. Most treatments recognize only two epthianurid genera, *Epthianura* and *Ashbyia*. Some authors suggest that three subgenera exist within *Epthianura*, the differences lying mainly in colour patterns; thus, the Crimson Chat is sometimes included within the subgenus *Parepthianura*, the Orange and Yellow Chats in *Aurepthianura* and the White-fronted Chat in *Epthianura*. The data derived from analysis of mitochondrial and nuclear DNA, however, indicate that the Crimson and Yellow Chats are, in fact, more closely related to each other than either is to the White-fronted and Orange Chats. It is interesting that the first two have distinct breeding and non-breeding plumages, whereas the White-fronted Chat, the Gibberbird and, from the available evidence, the Orange Chat do not. All five species exhibit sexual plumage dimorphism, but in the case of the Gibberbird this is subtle. Seasonal, sexual and age-related variation in plumage is discussed further below (see Morphological Aspects). There are also closer vocal similarities between the Crimson Chat and the Yellow Chat when compared with the Orange and White-fronted Chats (see Voice). The DNA data indicate that the Gibberbird lies outside these groups, thus supporting the recognition of a separate genus, *Ashbyia*. There is no evidence to suggest that any of the species of Australian chat hybridize with one another.

The fossil record provides no information concerning the evolution and ancestry of the Epthianuridae. The molecular data mentioned above, however, do shed some light on the evolution of honeyeaters. The DNA-sequencing studies undertaken by A. C. Driskell and L. Christidis suggest that the honeyeaters arose during the mid-Tertiary, when heathlands were widespread in Australia. The largely arid-adapted Australian chats probably arose after this time, when rainfall patterns changed and heathlands became more fragmented, and they are part of a genetic clade comprising Australian endemic honeyeaters *Conopophila* and *Ramsayornis* (which occur mainly in mangrove and watered habitats) and New Guinean highland species. There is little molecular evidence for the evolution of separate endemic Australian and New Guinean honeyeater radiations. Further work is needed in order to ascertain the origins of Australian chats and their relationships with other Australian and New Guinean endemic honeyeaters.

Australian chats share many features, particularly skeletal characteristics, with the Meliphagidae. These include the slender head and decurved bill, the slender and attenuate palate, small temporal fossae, fully perforate nares and a single, deep fossa at the head of the humerus. There are, however, significant differences between Australian chats and meliphagids in cranial anatomy, the former possessing thinner nasal bars, smaller, thinner ectethmoid foramina and flimsier terete maxillo-palatine processes. Australian chats differ further from honeyeaters in having only a vestigial brush tip on the tongue. Certain epthianurid species have bright yellow, red or orange plumage coloration, which renders them distinct from Australian honeyeater species with the exception of largely tropical and subtropical genera, such as *Myzomela*.

Four of the five members of the present family display no apparent geographical variation. There are several subpopulations of the Yellow Chat and three subspecies are recognized, these being distinguished mainly by slight differences in the breeding plumage of the adult males. Otherwise, the White-fronted Chat exhibits slight morphometric differences between populations in Tasmania and those in mainland Australia, the former having a longer average bill length compared with mainland individuals. This is probably a result of their geographical separation at times over the past 12,000 years and the effect of the Bass Strait as a barrier to gene flow.

### Morphological Aspects

Epthianurids are small terrestrial passerines which are largely adapted to arid and semi-arid environments in Australia. They present only slight variation in size, the Gibberbird being on average the largest species, 11–14 cm long and weighing 14–20 g, and the Yellow Chat on average the smallest, with a length of 11–12 cm and a weight of 7–10 g. There is evidence that individual weight varies throughout the day, as indicated by studies of the White-fronted Chat, ringed individuals of which weighed on average 1.1 g less at dawn compared with later in the day. In addition, the weight of this species was found to vary seasonally, White-fronted Chats tending to be heavier in spring than at other times of the year.

Australian chats are structurally similar to honeyeaters. They have rather a rotund body, more so than that of most honeyeaters, and they have fairly short, broad and rounded wings with ten primaries. The third and fourth outermost primaries are the longest, as opposed to usually the fourth and fifth in the Meliphagidae.



There are nine fully developed secondaries, including three tertials, and at least some species have a vestigial tenth, innermost, secondary. The secondaries have rather distinct emarginations on the outer webs. The alula and outer primaries of juvenile chats are more rounded than are those of adults. The ephthianurid tail is rather short, with a squarish or slightly rounded tip when folded; it contains twelve rectrices, the outermost of which is typically the longest. The bill is short and slender, and typically straight, although that of the Crimson Chat is slightly more decurved compared with the bills of the four other species. The nasal groove is elongated, occupying up to a third of the exposed culmen. The legs are fairly long and fine, and the feet are rather weak, with the middle toe the longest, the Yellow Chat's middle toe being comparatively longer than that of the other species. The tarsus is laterally compressed, scutellated at the front and smooth at the rear. Compared with the chats in the genus *Ephthianura*, the Gibberbird differs slightly in that it has a thicker bill and a slightly broader and shorter trans-palatine process.

The plumage is dense and, in the case of adult males, brightly coloured or patterned. In the Crimson Chat, and possibly other species, the feathers of the crown are erectile and can be puffed up in territorial or courtship displays (see Breeding). Plumage patterns vary within the family, adults of most species showing obvious sexual dimorphism, but the Gibberbird exhibits only slight plumage differences between the sexes. First immatures of the Crimson and Yellow Chats are sexually dimorphic in plumage. Juvenile plumage is superficially similar in colour to that of the adult female, but the feathers, particularly on the hindneck, mantle and rump, and sometimes on the uppertail-coverts, are softer and more loosely textured than those of first immatures and adults. This is due to the lower density of barbs in juvenile feathers compared with those of adults. Juvenile tail feathers are narrower and more pointed at their tips than those of adults, and the juvenile primaries, particularly the outer primaries, and alula feathers are slightly broader and more rounded at their tips. These differences in feather shape between juveniles and adults are similar to those found in many genera of honeyeaters.

Post-juvenile moult, also termed first pre-basic moult, probably starts within 2–3 months after the bird has hatched, and involves all or most feathers of the head and body and most of the wing-coverts. Most individuals retain at least some of the rectrices, outer secondaries, inner primaries, alula feathers, and greater primary and secondary upperwing-coverts. With the sole exception of the White-fronted Chat, the post-juvenile moult results in a first-immature plumage resembling that of the adult female of the species. In the case of the White-fronted Chat, the first immature is superficially similar to the adult of the corresponding sex; first-immature male White-fronted Chats show a distinct contrast between the retained juvenile upperwing feathers and the adult-like feathers replaced in the post-juvenile moult. With Crimson and Yellow Chats, first-immature males are usually more brightly coloured than are females of the same age. At least some of these young male Yellow Chats have a few blackish blotches on the breast, and a few individuals have a narrow blackish crescent similar to that of adult males. First-immature male Crimson Chats usually have richer red feathering on the crown and uppertail-coverts than do first-immature females, but they are not so richly coloured as are adult males. The adult plumage is probably acquired at about one year of age, in a complete post-breeding, or second pre-basic, moult.

An interesting difference among the five species of Australian chat concerns seasonal variation in adult plumage. This difference is most pronounced in adult males. The available evidence indicates that adults of both Yellow and Crimson Chats possess different breeding and non-breeding plumages, resulting from separate pre-breeding and post-breeding moults. The post-breeding moult is complete, and typically occurs from mid-spring to autumn, although the timing of the moult of Yellow Chats is not understood. The pre-breeding moult is partial, involving most feathers of the head and body and some wing-coverts, and possibly also some rectrices. In comparison, the meliphagid honeyeaters do not have separate breeding and non-breeding plumages, although the Banded Honeyeater (*Certhionyx pectoralis*) is thought to be one of the few exceptions to this rule.

The timing of the post-breeding primary moult of the Crimson and Yellow Chats may relate to the nomadic movements made by these species (see Movements). The replacement of the remiges is not always conventional, and arrested or suspended primary moult appears to be commonplace. It is possible that the primary moult is suspended or arrested when breeding activity occurs. In the case of the Crimson Chat, the pre-breeding moult tends to take place from late spring to late summer, resulting in the non-breeding plumage in autumn and winter.

As mentioned above, the timing of the pre-breeding and post-breeding moults of the Yellow Chat is not understood. There is some evidence that the two moult cycles overlap to some extent, as is thought to occur with certain species of fairy-wren (*Malurus*) in Australia.

## Habitat

Australian chats typically occur in low shrublands or in vegetation surrounding lagoons, swamps, and estuarine or riparian habitats. They are well suited to arid environments, largely because of their physiological adaptation to water stress. Lightly wooded country and shrub-steppe, including open chenopod and samphire shrublands, are favoured by most members of the family. All five species are seen mainly on the ground or in the understorey, and are rarely recorded in the upper levels of trees.

The Gibberbird probably exhibits the greatest degree of habitat selectivity of all ephthianurids. This species lives in some of the most arid areas of Australia, typically on gibber plains, stony country with a sparse vegetative cover including Mitchell grass (*Astrelia*), saltbush (*Atriplex*), bluebush (*Maireana*), copper-burrs and bindyis (*Sclerolaena*) and other low shrubs and herbs. The Crimson and Orange Chats, too, occur in arid areas, but their ranges extend to semi-arid, temperate and occasionally subtropical environments, particularly during periods of inland drought. Crimson Chats are often found in mulga and riparian woodlands in central Australia, whereas Orange Chats tend to show a preference for low-growing shrublands such as samphire shrubland and low herblands or shrublands surrounding drainage lines and wetlands. The Yellow Chat typically occurs in vegetation associated with ephemeral or semi-permanent wetlands; its favoured habitats include lignum (*Muehlenbeckia*) or tall grasses, such as *Eragrostis* or *Sporobolus*, associated with freshwater or saline wetlands in inland and northern Australia. Occasionally Yellow Chats occur in chenopod and samphire habitats.

White-fronted Chats make use of a more extensive array of habitats compared with the other members of the family. The White-fronted Chat occurs in coastal shrublands, low samphire shrublands, vegetation surrounding freshwater wetlands, riverine areas, mallee heath, open woodland, open forest, and altered habitats such as golf courses and farmland. In mallee-heath habitats of south-eastern Australia, the White-fronted Chat is known to colonize recently burnt areas.

As suggested above, some species appear to adapt to a wider range of habitats when undergoing nomadic movements (see also Movements). Crimson and Orange Chats typically occur in arid habitats in inland Australia, but during drought periods in those regions these species move to subcoastal and even coastal environments. White-fronted and Yellow Chats may likewise undertake nomadic movements, but it is not understood if they make any associated changes in habitat selection.

The majority of the species occur in low-lying areas, typically from sea-level to elevations below 1000 m. White-fronted Chats are occasionally recorded at higher altitudes, as, for example, on the Southern Tablelands of south-eastern Australia.

## General Habits

Most Australian chats are frequently observed on the ground or atop shrubs and low bushes, particularly during the breeding period. They are typically easy to approach and are not especially wary of human observers, although they are more wary when nesting. The Gibberbird rarely, if ever, perches on the tops of



The most distinctive and widespread member of the family is the **Crimson Chat**. Like most of its congeners it is sexually dimorphic. The male is bright red on the cap, and much of the underparts, while the female is largely brown and whitish.

The crown feathers in this species, and possibly in other Australian chats, are erectile, and can be raised in display. Moults and seasonal variation are poorly understood in the family, but males of this species appear to undergo separate pre-breeding and post-breeding moults, resulting in different breeding and non-breeding plumages. The non-breeding plumage is significantly duller.

The bill of the Crimson Chat is short, slender, and blackish. The culmen is slightly more decurved than in other epthianurids, but like them it bears an elongated nasal groove for nearly a third of its exposed length.

[*Epthianura tricolor*.

Above: Merrapina, W New South Wales, Australia.

Photo: Stanley Breeden/Lochman Transparencies.

Below: between Bollon and Cunnamulla, SW Queensland, Australia.

Photo: Raoul Slater/Lochman Transparencies]

shrubs, but it has been recorded as perching on fence posts. Most members of the family are readily detected by sight and call, but the Gibberbird tends to be more cryptic, blending in with the substrate more effectively than do the other species. All species are diurnal in activity.

The majority of epthianurids allow fairly close approach by the observer. They are often observed while they are walking, not hopping, on the ground, when they have an upright stance and a rather jerky action. The flight of most is characteristically rather buoyant, jerky and undulating, and often fairly high. White-fronted Chats are often seen in flight overhead, when the distinctive "tang" calls alert the observer to their presence. White-fronted,

Crimson and Orange Chats often perch on the tops of taller shrubs and small trees, particularly during the breeding season when the adult males establish and advertise their territories. The Gibberbird, while perched on a stone or on the ground, often adopts a characteristic upright stance, frequently with the tail held in a lowered position, in a manner not unlike that of the Australasian Pipit (*Anthus novaeseelandiae*). Gibberbirds, however, often remain almost motionless when approached by the observer, and this behaviour appears to be distinct among the Australian chats. When flushed, Gibberbirds typically move in a rather strongly undulating flight, and they are known to use mammal burrows as refuges in which to evade the observer.





Australian chats eat insects, which they capture from bare ground, or occasionally from shrubs and small trees. The **White-fronted Chat**, a familiar species in many parts of Australia, is the best-known member of the family. It captures a wide range of adult and larval insects, including beetles, bees, butterflies, moths and grasshoppers. It also eats non-insect food, such as spiders, springtails, isopods, and occasionally small gastropods. This female is devouring typical prey—an insect larva—but the diet includes a small proportion of plant material, including seeds, nectar and fruit.

[*Epthianura albifrons*, Augusta, Western Australia, Australia.  
Photo: Ian Montgomery]

At the start of the breeding season, male Crimson Chats perform distinctive display-flights, either for territorial advertising or as part of the courtship ritual. The male flies on a steep angle from the top of a shrub or small tree to a height of more than 10 m, gives a territorial call, and then, folding the wings towards the body, descends back to a perch on top of a shrub. Courtship-flights are discussed in more detail later (see Breeding).

The adult males of most epthianurid species are brightly coloured and are conspicuous in the field. For example, the striking red uppertail-coverts of the Crimson Chat allow most observers immediately to detect and identify the species, even when it is only briefly glimpsed. Adult females, immatures and juveniles tend to be less conspicuous than adult males. The Orange, Crimson, Yellow and White-fronted Chats have fairly prominent calls, allowing for ready detection by the observer (see Voice). The Gibberbird, on the other hand, has somewhat weaker calls and is probably less readily detected by means of its voice. The distinctive injury-feigning "broken-wing" display of most species also alerts observers to the presence of the bird and a nearby nest (see Breeding). Male Crimson Chats have erectile crown feathers, and these are raised when the bird is advertising its territory (see Breeding).

Although most members of this family are recorded in pairs or small groups, they do sometimes form larger flocks. White-fronted, Crimson, Yellow and Orange Chats are occasionally observed in flocks containing 50 or more individuals. The Gibberbird, however, typically occurs in pairs or small parties, and is seldom seen in flocks of more than four or five birds. White-fronted, Orange and Crimson Chats tend to gather in flocks in the non-breeding season, but often live in pairs in the breeding season. Many of the larger flocks of Crimson Chats observed in the non-breeding season are thought to consist largely of immatures, but it is difficult to distinguish between immatures and adults in non-breeding plumage. More detailed information, including analysis of trapped individuals, is needed in order to ascertain the age and sex ratios in these flocks. At the start of the breeding season, some species, including the Crimson and White-fronted Chats, disperse in pairs. In the case of the White-fronted Chat, flock size is known to vary throughout the day, at least at some locations. At one site in southern Victoria, for example, flocks of this species, and also the proportion of the population contained within flocks, are larger just before sunset than they

are at midday. For the Yellow Chat and the Gibberbird, there is little information on seasonal or other changes in flock size, probably because these species occur mainly in remote areas of Australia and are seldom studied.

Flocks of White-fronted Chats will rise in the air and circle when predators such as the Brown Falcon (*Falco berigora*) or the Australian Kestrel (*Falco cenchroides*) are nearby. The flock-members keep in contact by calling to each other.

The roosting behaviour of the family is not well understood. White-fronted Chats roost communally, typically in low samphire shrubs, arriving in flocks in the evening. Incubating and brooding females of this species apparently roost in the shrub in which the nest is built. The Crimson Chat and the Orange Chat will also rest up and sleep in low shrubs during the heat of the day. There is no information available on the roosting habits of the Yellow Chat and the Gibberbird.

Preening behaviour is equally poorly documented. White-fronted Chats bathe in freshwater pools, and it is likely that the other members of the family do likewise. Crimson Chats have been recorded as sun-bathing and dust-bathing in captivity, but there are no known observations of such behaviour by epthianurids living in the wild. Again, it seems probable that this behaviour does occur but has yet to be seen by ornithologists.

## Voice

Australian chats have a fairly wide variety of calls, but, given the relatively common status of several of the species, surprisingly little is known about the vocalizations of the family. Typically, the calls are not particularly loud, but they are quite readily heard in the field and are often diagnostic. Most species have distinctive contact, advertising and display calls, given by individuals either when perched or when in flight.

Vocalizations vary from relatively simple notes to more complex songs, depending on the species. The majority of them utter a variety of sounds, including fairly high-pitched whistles and piping calls, churring and chattering notes, and metallic, nasal, buzzing and twittering sounds. One of the more interesting aspects of non-vocal sounds, at least of some species, is bill-clicking, which is performed in territorial display (see Breeding). The Crimson Chat has a broad repertoire of calls, which vary accord-

ing to behavioural activity. This species emits the full range of sounds mentioned above, including a sweet "wheee" whistle given one or more times in succession, a louder "tee wheee" call given in display-flight, short nasal or metallic single-note calls, harsher "jet jet" and short and soft "jut jut" notes, and faint twittering calls. This is one of the species which clicks its bill in display, but there are few details and no published sonagrams of the sounds produced by this action. Crimson Chats are said also to make a faint hissing sound in distraction display (see Breeding). The Yellow Chat apparently has a range of calls similar to that of the Crimson Chat. These include a high-pitched three-note whistle transliterated variously as "pu-li-pii" or "pli-pi-lii" and given at a pitch similar to that at which the whistles of the Crimson Chat are uttered, which is about 4 kHz. Yellow Chats are known to emit short harsh chirping or churring calls in distraction display, as well as short, nasal "tang" calls similar to those of most other members of the family.

The vocal repertoire of the Orange Chat is poorly known, but it includes nasal single-note "tang" calls, not unlike those made by White-fronted Chats, a fairly distinctive metallic rasping call with a pitch of up to 6 kHz, a soft "shu-shu" in distraction display, and weak songs given in display and from the tops of shrubs. The evidence strongly indicates that Orange Chats are not so vocal as are Crimson Chats and their calls are not so loud or diagnostic. In contrast, the White-fronted Chat has what is perhaps one of the most diagnostic calls of any species of Australian chat, this being a fairly loud nasal "tang" contact call given in flight or from atop a shrub. Indeed, one of the common colloquial names applied to this epthianurid is "Tang", a direct reflection of this call. The "tang" call is not unlike that uttered by the Zebra Finch (*Taeniopygia guttata*), and the latter species, a member of the family Estrildidae, is known to respond to calls made by White-fronted Chats. The White-fronted Chat is not known to sing obvious songs, or, at least, not to deliver such songs frequently, but it does produce chattering calls and bill-clicking sounds.

Although the voice of the Gibberbird is rather poorly known, this species does emit weak twittering and chattering notes, as well as plaintive piping and rapid whistling calls. The multiple-note piping calls of this species can descend or ascend slightly in pitch.

There appear to be only few examples of members of this family indulging in vocal choruses. Crimson Chats sometimes occur at rather high population density, particularly after good rains in the arid zone, and in these circumstances numerous individuals can be heard calling at one time. There is, however, no

evidence for antiphonal calling, or duetting, by Australian chats. The behavioural functions of epthianurid calls are not well understood. Distinctive whistling calls are given by males of such species as the Crimson and Yellow Chats in display-flight, and are typically uttered during the steep descent phase of the flight. Apart from this, however, no vocal differences between the sexes or between different age-classes have been documented in any concise studies. Captive adult male Orange Chats are said to give soft notes as a means of prompting females to approach, and parents with food utter similar calls in order to attract their young.

### Food and Feeding

Australian chats feed predominantly on arthropods, some species supplementing the diet with seeds or nectar. They take food items generally from the ground, herbs or low shrubs, but occasionally from tall shrubs or trees.

While some information on food items and feeding behaviour exists for all members of the family, the only one for which the diet and feeding behaviour have been closely studied is the White-fronted Chat. The adults of this species feed mainly on the larvae of small insects, principally beetles (Coleoptera), flies (Diptera), ants and wasps (Hymenoptera) and bugs (Hemiptera). White-fronted Chats also consume the larvae of earwigs (Dermaptera) and lacewings (Neuroptera), but the stomach contents of individuals analysed indicate that these represent only a minor part of the diet. Mites (Acarina), small molluscs, spiders (Araneae) and springtails (Collembola) are known food items of this species, but the evidence suggests that these, likewise, are a minor component of their diet. In addition, this epthianurid takes seeds of acacias (*Acacia*), as well as nectar from various plants, again in small quantity. In one study of White-fronted Chats in southern Victoria, only 0.5% of 226 stomach contents contained seeds.

Other species of Australian chat appear to take similar foods. There is some information on the diet of the Crimson Chat, the known food items of which are similar to those of the White-fronted Chat. The Crimson Chat, however, also consumes larvae of moths and butterflies (Lepidoptera) and nymphs of grasshoppers (Orthoptera), as well as seeds of various chenopods (Chenopodiaceae), including the genera *Rhagodia* and *Sclerolaena*, and grasses (Poaceae). Crimson Chats take nectar from various plant species, including native bean (*Bauhinia*), *Grevillea*, *Hakea* and eucalypts (*Eucalyptus*) or *Corymbia*.

**The Orange Chat,** another family member chiefly confined to Australia's dry interior, often forages on sparsely vegetated flats around saltlakes. It kills prey by beating it against the ground, and manipulates it in its bill before swallowing. In this case the food item is an adult lepidopteran. The Orange Chat is often found singly or in pairs, although it is sometimes reported accompanying mixed-species foraging parties, or feeding in the company of granivorous birds, such as Zebra Finches (*Taeniopygia guttata*).

[*Epthianura aurifrons*,  
Rawlinna,  
Western Australia,  
Australia.

Photo: Graeme Chapman]







Physiological studies have revealed that Australian chats are well adapted to arid environments. Their water requirements are derived largely from food sources, or by metabolism, and they seldom need to drink. Wetlands are also attractive as sources of food. Epthianurids are regularly seen feeding on insects by picking them from the muddy margins of ponds, snatching them from sedges, or making short sallies low over water. Most visits to water for drinking, bathing or foraging take place early or late in the day, hence the long shadow cast by this male Yellow Chat.

[*Epthianura crocea crocea*, SE of Boulia, W Queensland, Australia. Photo: Roland Seitre]

Foods accepted by epthianurids in captivity has been documented for some species, particularly the White-fronted Chat. Captives take a large range of items, including flies, bees, midges, termites (Isoptera) and spiders.

Some species have been seen to drink water. Crimson Chats drink dew on vegetation or take rainwater from small pools in the early morning or late afternoon, but not in the mid-afternoon. There are very few records of epthianurids drinking saline water, but Orange Chats are known to do so on rare occasions. Physiological studies indicate that the members of this family are highly adapted to conditions of high aridity and seldom need to drink. Their water requirements are derived largely from food sources or by metabolism.

Typically, Australian chats capture their food from bare ground, from grassland or from low shrubs or herbs. Occasionally, they take items from atop shrubs or small trees. Crimson Chats sometimes forage among the foliage of trees and shrubs, and on flowers of various species. White-fronted and Yellow Chats will seize food items from muddy substrates or from areas of very shallow water, and the latter species will also glean items from the inflorescences of sedges (Cyperaceae) and grass stems or from floating vegetation in wetlands. Gibberbirds snatch food items from the ground, but they also sally for insects up to 1 m above the ground. Furthermore, both the Gibberbird and the White-fronted Chat take fly larvae from clods of clay, and Gibberbirds have been observed to take maggots from dead sheep. White-fronted Chats are known to feed on freshly tilled soil, following the plough.

Members of this family forage singly, in pairs or in flocks, but Gibberbirds are usually seen to feed as singles or pairs. White-fronted Chats often forage in flocks, sometimes of up to 50 individuals, particularly in autumn and winter. Exceptionally, flocks of over 100 White-fronted Chats have been reported. Mixed-species feeding parties are not uncommon, and flocks containing Crimson, Orange and White-fronted Chats have been observed. In addition, Orange Chats have been recorded as feeding in company with Zebra Finches, and other bird species known to form loose feeding associations with Australian chats include woodswallows (*Artamus*), Australasian Pipits and Common Starlings (*Sturnus vulgaris*). In north-west Western Australia, Yellow Chats have been observed to feed alongside migratory waders, including Oriental Plovers (*Charadrius veredus*), Sharp-tailed Sandpipers (*Calidris acuminata*) and Red Knots (*Calidris canutus*) in wetland habitats.

There is little information available on any age-related, sex-related or geographical variation in the diet or the feeding behaviour of these species. Nestlings and fledglings of the White-fronted Chat are often fed by the parents with insect larvae, particularly caterpillars, but grasshoppers and spiders are also known food items of young.

## Breeding

Few detailed studies of breeding by Australian chats have been undertaken, and most of the information is based on observations of Crimson and White-fronted Chats. The breeding biology of the Yellow Chat and the Gibberbird is poorly documented, and information on the breeding of the Orange Chat is fairly scant. Basic data concerning the breeding season, the nest structure and nest-site, the clutch size and the egg pigmentation are available for all members of the family, but information on reproductive behaviour is lacking for some.

Epthianurids breed mostly as single pairs. There is no evidence for co-operative breeding among the members of this family, but White-fronted Chats often nest in loose groups or semi-colonially, as detailed later in this section.

From the available evidence, it appears that all species are territorial, although almost nothing is known about the territoriality of the Gibberbird. Within a single breeding season simple monogamous pair-bonds appear to be typical, the pair-bond evidently being maintained when a pair attempts to re-nest in the same season. Although the circumstances among Yellow Chats and Gibberbirds are not documented, there is some anecdotal evidence that pairs of these species attend nests. Little is known about the stability of the pair-bond outside the breeding season. For the White-fronted Chat, observations suggest that bonds are not usually maintained over the long term, but some partners are known to reunite in the following breeding season. Evidence derived from observation of captive Crimson and Orange Chats indicates that the pair-bond is not strong.

Rain appears to be the main factor influencing the timing of breeding by Australian chats, particularly in the cases of the nomadic Crimson, Orange and Yellow Chats. Major irruptions of Crimson and Orange Chats are often associated with good rains and concomitant breeding. For some species, such as the White-fronted and Crimson Chats, breeding has been recorded in most

Many insectivorous birds, including Australian chats, provision their nestlings and fledglings with small prey and soft-bodied larvae. This male **White-fronted Chat** is perched alertly on a low bush with a beak full of such items, suggesting that he is returning from a hunting foray to feed his offspring. This species is perhaps the most adaptable eptianurid, occupying a range of habitats—including samphire shrublands, riverbanks, mallee heath, open forest, golf courses and farmland—and using a variety of foraging techniques. It quickly colonizes burnt heaths, and has even been reported following ploughs to forage on freshly tilled soil.

[*Epthianura albifrons*,  
Corunna Station,  
South Australia, Australia.  
Photo: Graeme Chapman]



months, but there are trends in seasonality. In southern and coastal Australia, for example, the White-fronted Chat typically breeds from late winter to late spring, after the winter rains, with some nesting records in summer and autumn if rainfall provides suitable conditions. Farther north, breeding by this species apparently starts earlier. In Western Australia, the Crimson Chat breeds during February to April in the north of its range and progressively later farther south. The breeding season of Yellow Chats is poorly known, but nesting has been recorded through much of the year when conditions are suitable. Most breeding records of the Gibberbird are from September and October, particularly after the first rains, but this species, too, can nest at virtually any time of the year if conditions are conducive. Most members of the family are known to nest more than once in a season. Crimson and Orange Chats may breed two or three times within a year, and White-fronted Chats will nest up to five times in a single year. In one study in Western Australia, a population of White-fronted Chats showed a reduced breeding effort in years with lower winter rainfall.

A distinctive feature of some species is the advertising display-flight performed by the male at the start of the breeding season. That of the Crimson Chat is well described. The male of this species flies from the top of a shrub at one side of his territory in a steep ascent while giving a strong oscillating or clinking call (see Voice); once he reaches the zenith of the flight, the chat holds the wings back and glides in a steep descent while uttering a mournful "tee-wheree" call, and then lands on a shrub at the other side of his territory. These display-flights are sometimes made for the purpose of advertising the territory to opponents, the male exhibiting his red plumage during the flight. At other times these flights take the form of rituals, performed in close proximity to, or directed at, the female. During the display-flights in the proximity of the female, the male raises his crown feathers and spreads his tail feathers. Gibberbirds, too, perform distinctive display-flights in the breeding season, but the flight in this case is said to comprise a vertical stepped climb from the ground, the bird calling during the ascent, followed by a rapid vertical dive back to the ground. Male Yellow Chats make display-flights accompanied by short piping calls, but descriptions of the flight suggest that it is apparently lower and less intense than those of Crimson Chats and Gibberbirds. No display-flights have been documented for the Orange and White-fronted Chats.

Courtship and sexual behaviour are not well documented. Male Crimson Chats are known to raise the red feathers of the

crown when courting, and copulation by this species is initiated by the male, which crouches and tilts his body while shaking his tail in a lateral motion. In the case of the White-fronted Chat, copulation, which is said to last only a few seconds, takes place near the nest three or four days before the first egg is laid.

Agonistic defence of the nesting territory involves both song and movement. Male Crimson Chats exhibit a distinctive territorial posture in which the spread tail is repeatedly dipped and the red crown feathers are raised while the head is simultaneously turned from side to side. Bill-clicking and territorial chases are also given when another Crimson Chat, apart from the male's female partner, approaches the nesting territory. Similarly, male White-fronted and Orange Chats click the bill and make territorial pursuits of rivals, but there is no evidence to suggest that song forms part of the agonistic display. Fighting is rarely reported, although territorial male White-fronted Chats are known to engage in physical contact during territorial chases. A close relationship between territorial behaviour and water loss has been documented for arid-zone species. Mate-guarding is well documented for White-fronted Chats; it can start several weeks before nesting begins, and may relate to a high sex-ratio bias favouring males in certain populations.

Nests are either solitary or placed in loose colonies. Those of White-fronted Chats are sometimes as little as 3–4 m apart, and a density of 18 nests of this species within 0.8 ha has been recorded in southern Victoria. Estimates of the size of the breeding territory vary from 0.2 ha to about 500 m<sup>2</sup> for the Crimson Chat, 15 nests of which have been found within an area of 2.8 ha. Nests are sometimes sited close to nests of other species. For example, Crimson Chat nests have been placed within 20 m of the nest of a pair of White-winged Trillers (*Lalage tricolor*), and within a few metres of a White-fronted Chat's nest.

Epthianurid nests are usually placed in a small shrub, where they are built typically less than 0.5 m above the ground, but occasionally higher. Gibberbirds place the nest on the ground or within a small clump of grass. Samphire species such as *Halosarcia* and *Sarcocornia*, as well as other species of the Chenopodiaceae such as saltbushes, bindyis and bluebushes, are used as nesting sites. Low shrubs around saline lakes and on the edge of watercourses are often selected. Other plants used as nest-sites include grasses, rushes, lignum, and weeds such as thistles (Asteraceae). Live plants are usually used, but dead plants occasionally afford sites for nesting. Nests can be placed near the top





The nest of the **Crimson Chat** is a slightly untidy cup built mostly from plant material, including twigs, grass, bark strips, and rootlets. It is lined and bound with soft material, such as plant down, man-made fibres, animal hair and feathers, including sometimes those of Emus (*Dromaius novaehollandiae*).

The nest is placed within a metre of the ground in a low shrub, most often around 20 cm up. Both sexes are known to share incubation duties, and in this case the male is shown. The incubation period lasts 10–14 days.

[*Epthianura tricolor*, between Bollon and Cunnamulla, SW Queensland, Australia.  
Photo: Raoul Slater/  
Lochman Transparencies]

of a plant or lower down, closer to the ground. Crimson Chats usually conceal their nests at the base of a small shrub, and sometimes on dead fallen branches or among vegetation growing through fallen branches. Nests may be placed in the fork of branches or, less often, among the outer foliage of shrubs. Crimson Chats build the nest at an average of 20 cm above the ground, but the height can vary from ground level to 100 cm up. Epthianurid nests are often detected by the distinctive behaviour of the adults, including the injury-feigning broken-wing display performed nearby. Otherwise, they are usually quite well hidden and can be difficult to locate unless the adults are nearby.

Available evidence indicates that the female builds the nest, although, in the case of some species, both sexes are known to carry nest materials. The task of nest-building has been studied intensively for the White-fronted Chat. With this species, most of the construction work occurs in the early to middle part of the morning, and White-fronted Chats take about ten days to build a nest, but can take as few as six days and as many as 16. Gibberbirds probably require the least amount of time in which to construct a nest, observations indicating that nest-building by this species is completed after six days. Crimson Chats, after the loss of a first clutch, will start to build another nest within five days.

The nests of this family are cup-shaped structures, and they differ subtly among species. Those of the Orange, Yellow and Crimson Chats are rather small cups which are typically neat, but sometimes rather untidy. White-fronted Chats have somewhat bulkier, thicker-walled nests, and Gibberbirds build rather deep cup-shaped nests. The dimensions vary slightly from one species to another. The nests of Orange Chats and Yellow Chats have an external diameter of 9–13 cm and are 3.5–7.5 cm deep externally. Corresponding figures for Crimson Chat nests are 6–14 cm and 4.5–8 cm. The nests of White-fronted Chats have an external diameter of 7–15 cm and an external depth of 6–7 cm. Gibberbird nests measure about 12 cm in diameter, and they are placed in a depression in the ground measuring about 10 cm across and 7–8 cm in depth. Nests are constructed from a range of materials, depending on availability, but typically comprising various combinations of fine twigs, grass stems, hair, including wool, feathers, rootlets, bark fibre, spider egg sacs and plant down. The

feathers of Emus (*Dromaius novaehollandiae*) are sometimes incorporated in nests of Crimson Chats. Other materials utilized by various species include flowers, seeds and such man-made fibres as string. In coastal areas, dried sea-grass (*Posidonia*) is often used by White-fronted and Orange Chats. The materials are woven together, and the structure is lined with finer materials, mainly fine rootlets and grass stems, hair, feathers, spider egg sacs and fine bark pieces.

Australian chats lay oval-shaped eggs which are smooth and sometimes slightly lustrous. Those of most of the species have dimensions of 15–19.5 mm × 11–14 mm, but Gibberbirds' eggs are slightly larger. The ground colour of the eggs of Crimson and White-fronted Chats is usually reddish-white, pinkish-white or white; that of Gibberbird eggs is fleshy white and that of Yellow and Orange Chat eggs is pure white. The markings vary among species. Eggs of White-fronted Chats have reddish-brown, purplish or dark brown blotching or spotting, often concentrated towards the larger end to form a poorly defined penumbral ring or zone. Yellow Chats' eggs have sparse, fine dark brown or blackish-red spotting or dotting, usually confined to the larger end, where the marks sometimes form a penumbral ring. Orange and Crimson Chats have similar egg pigmentation to that of Yellow Chats, but the markings tend to be more prominent and are not confined to the larger end. Inspection of museum collections of clutches indicates that egg pigmentation varies among clutches of the same species, and it is especially difficult to distinguish between the eggs of Orange Chats and those of Crimson Chats.

For species for which adequate information exists, clutch size varies from two to four eggs but typically is of three eggs. Only three-egg clutches have been recorded for the Yellow Chat, but there are few data for this species. White-fronted and Crimson Chats have occasionally been recorded with clutches of five eggs. Laying normally starts within 1–2 days after the nest has been completed, and eggs are laid on consecutive days. Crimson Chats commence laying almost immediately after nest construction is finished. White-fronted Chats are known to start a second clutch as soon as the young of the first brood reach independence. Incidentally, if the first clutch of the latter species fails, a replacement clutch is usually laid in a newly constructed nest.



Incubation is undertaken by both sexes of the Crimson, Orange and White-fronted Chats, but the limited observations on Gibberbirds suggest that only the female of that species incubates. It is said that, in captivity, only the female of the Crimson Chat incubates. For the Yellow Chat, there are no published data on the role of sexes in this respect. The incubation period is 10–14 days for the Crimson Chat, 11–12 for the Orange Chat, and 13–14 days for the White-fronted Chat; no corresponding information is available for the Yellow Chat and the Gibberbird. For those epthianurids for which relevant data exist, incubation starts with the second or third egg laid, but White-fronted Chats may sometimes start to incubate after laying the first egg. The chicks are altricial and nidicolous. They are blind and naked at hatching, but, at least in some species, within a few days they acquire a sparse covering of down. White-fronted Chat nestlings develop feathers by about six days of age, open their eyes when about seven days old and are well feathered by the age of ten days.

Both sexes brood and feed the young and both remove faecal sacs from the nest, but in the case of the White-fronted Chat, at least, only the female broods at night. From the time of incubation until the point at which the young leave the nest, both adults engage in anti-predator distraction displays, which characteristically involve the feigning of injury. Crimson, Orange and White-fronted Chats often perform a distinctive "broken-wing" display while shuffling away from the nest area, and Gibberbirds distract a potential predator's attention by shuffling along the ground, with the wings held lowered, and often rolling the body from side to side.

The nestling period is generally 9–11 days, that of White-fronted Chats tending to be slightly longer, at 10–15 days. After having left the nest, the young are initially unable to fly, but they can run and are therefore able to find shelter or to hide under cover. Fledglings remain in the nesting territory for a few days and are dependent on the adults for up to two weeks. There is little information on the movements of juveniles once they have become independent, but studies of White-fronted Chats suggest that these exhibit little fidelity to the nesting site. White-fronted Chats are able to breed when about one year old, at which time they are still in immature plumage.

Some Australian chats are subject to brood parasitism. Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) is a widespread

species throughout Australia and is known to lay its eggs in the nests of, among many others, the White-fronted, Crimson and Orange Chats.

There are few data on the breeding success of the Epthianuridae, with the exception of the White-fronted Chat. For this species, hatching success is estimated at 62%, with fledging success estimated at 28–66% depending on the study and the site; an average of 0.71 young is fledged per nest per breeding attempt. In one study of White-fronted Chats in southern Victoria, 30% of nests resulted in at least one young which lived to ten days or more, and 83% of the failures were due to predation. Cats, introduced foxes (*Vulpes*), snakes and other birds, such as the Little Raven (*Corvus mellori*), are known predators of epthianurids. Nest failure results also from desertion and from inclement weather, particularly rain and cold, as well as from the aforementioned brood parasitism. Otherwise, hatching success is about 65% for the Crimson Chat and 64% for the Orange Chat, and the fledging success of Crimson Chats is estimated at 20–26%.

### Movements

Little is known about the movements of Australian chats, and knowledge of this aspect of their lives is complicated, at least in some cases, by seasonal variation in the conspicuousness of the species in question. In Australia, there is also a tendency for human observers to avoid inland areas in summer because of the extreme temperatures, and this has created a strong bias in the seasonal distribution of bird records. Crimson and Orange Chats are largely nomadic, but they also make seasonal movements. Yellow Chats are thought to be similarly nomadic, but there is evidence to suggest that some populations are mainly sedentary. White-fronted Chats apparently vary in their movements, depending on geographical location; they seem to be mostly sedentary, but some evidence suggests that seasonal shifts or nomadism occur. Movements of Gibberbirds are virtually unknown, but nomadism and seasonal movements are again suggested.

The movements of some species are probably related strongly to rainfall events and seasonal conditions. The Crimson Chat is a highly nomadic species, but there may also be a seasonal compo-

The **Orange Chat** has been reported breeding in most months of the year, and sometimes produces three or more broods, depending on local conditions. This species is partially nomadic, arriving and breeding in numbers after good rains. Like other epthianurids, it is socially monogamous, and both sexes contribute to rearing the young. In this instance a male is feeding a brood of two nestlings; the duller female has a pale supercilium, and lacks the black throat. The nestling period usually lasts 10 days.

[*Epthianura aurifrons*,  
Australia.  
Photo: ANT/NHPA]





nent to its movements. Most records of this ephianurid in the northern half of Australia, north of 31° N, are during late summer to winter, and the species is not often recorded in the south of the country during this period. In southern, subcoastal Australia, Crimson Chats are more often recorded in spring and early summer. In parts of coastal south-western and south-eastern Australia, the species is very common in certain years, particularly during inland droughts or periods of low rainfall. In many inland areas of South Australia and Western Australia populations of Crimson Chats are high after good rains, but there is a tendency for numbers to be higher in winter and spring. Large irruptions occur, particularly in arid areas, after good rains, and these invasions are typically accompanied by widespread breeding activity. In arid north-west Western Australia, populations tend to be higher in the wet season, decreasing in the dry season. In the subtropical Kimberley region of Western Australia, immatures are often recorded in the dry season, during autumn and winter, but they are not often recorded in the September–March wet season. Overall, patterns of movement by the Crimson Chat are unpredictable.

As with Crimson Chats, the movements of the Orange Chat are varied and not predictable. Populations of Orange Chats seem often to mirror those of Crimson Chats, and the two are sometimes recorded together in mixed-species flocks, particularly in southern Australia, and at times both are found alongside groups of Australasian Pipits. Major irruptions of Orange Chats occur in arid and semi-arid areas after good rains, but there does appear to

be some seasonality which compounds the complexity of this species' movements. In a few areas, Orange Chats are thought to be largely resident, but their numbers fluctuate. Although the movements of Yellow Chats are very poorly understood, this species' ability to colonize remote areas when permanent water sources are established does suggest the occurrence of nomadic and long-distance movements. Yellow Chats are believed to be resident in parts of north-western Australia, as, for example, around Roebuck Plain, but their numbers fluctuate. In subtropical regions of the Northern Territory, this species is considered to be mainly resident or to undertake localized movements according to seasonal variation in wetland conditions. There may also be short local movements of Yellow Chats in inland Queensland, individuals shifting according to seasonal water availability and vegetation condition around bores and drainages.

The complexity of the movements of Crimson Chats is reflected not only in temporal and geographical variation in populations, but also in the birds' moult patterns. As mentioned earlier (see Morphological Aspects), the primary moult of this species is often arrested or suspended, and many adults show complex moult contrasts within the remiges and rectrices. This suggests that the timing of moult is not so predictable as it is for White-fronted Chats, which undergo a complete post-breeding moult from late spring to autumn, and this fact may reflect a high degree of nomadism and opportunistic breeding. Yellow Chats exhibit a pattern of primary moult similar to that of Crimson Chats.



Few studies of breeding behaviour have focused on the Australian chats, and basic data are lacking for most members of the family. Preliminary fieldwork has shown that the incubation period of the *Crimson Chat* lasts 10–14 days, while the nestling period lasts 9–11 days. Throughout this time both sexes collaborate to raise the young, as illustrated by this image of a male arriving to feed a brood of three nestlings while his partner perches on the rim of the nest. As well as incubating and provisioning, their duties include nest defence: they attempt to distract predators, and to lure them away from the nest, by feigning injury and fluttering along the ground.

[*Ephianura tricolor*, Australia.  
Photo: Michael Morcombe/  
NHPA]



Most clutches of the **Crimson Chat** consist of 2–4 eggs, although up to five eggs have occasionally been reported. According to the results of field studies, around 65% of eggs reach hatching stage, and overall fledging success is 20–26%. These losses are caused by avian brood parasites, such as *Horsfield's Bronze-cuckoo* (*Chrysococcyx basalis*) and predatory birds, such as the *Little Raven* (*Corvus mellori*), as well as introduced foxes (*Vulpes*) and cats. Here, a male feeds a brood of four nestlings with larval lepidopterans.

[*Epthianura tricolor*,  
Merrapina,  
W New South Wales,  
Australia.

Photo: Stanley Breeden/  
Lochman Transparencies]



Insufficient ringing data exist for any accurate determination of the movements made by the members of this family. Almost all recaptures are from places less than 10 km from the original site of ringing, but there is a record of a ringed White-fronted Chat being recovered more than 10 km from the initial site. Crimson and White-fronted Chats sometimes arrive in areas just a few months after a fire has taken place, including sites where they had not previously been recorded, but this may be a result of local nomadism rather than broad-scale movements.

### Relationship with Man

Indigenous people in Australia had names for certain species of bird and other animals. The name "Nyee-nyee" was applied by some tribes to both the Crimson Chat and the White-fronted Chat, probably referring to the calls of these epthianurids. Similarly, the Orange and White-fronted Chats are sometimes given the colloquial name of "Tang", which is the sound of the flight call made by these species.

Otherwise, there is little information on the influence of these birds on human thinking or behaviour. The fact that they inhabit arid areas where human beings, if present at all, are very sparsely scattered presumably has something to do with this.

### Status and Conservation

No member of the Epthianuridae is globally threatened. Indeed, of the five species, only the Yellow Chat is considered to have significant conservation issues. Its subspecies *macgregori*, from central-eastern Queensland, is considered "critically endangered" under both national and state legislation. This form was probably never common, and it was thought even to have become extinct in the early part of the twentieth century, but there have been recent discoveries of *macgregori* in the Fitzroy River Basin and on Curtis Island, in eastern Queensland. The subspecies *tunneyi* of the Yellow Chat, which is restricted to the north-west part of Northern Territory, is regarded as "endangered". Excessive grazing by stock, and weed infestation, may adversely affect populations of this species, which is considered of special concern at a national level.

On the positive side, White-fronted Chats have probably benefited from the widespread clearance of native vegetation for agriculture and pastoral activity, as evidenced by their preference for open pastures and farmland. The development of land for housing and industrial facilities, however, has led to declines in the numbers of this species in parts of southern Australia, particularly in the larger urban areas, and especially on the coasts of south-eastern Queensland and northern New South Wales.

In contrast, there is little or no evidence to suggest that the Crimson Chat, the Orange Chat and the Gibberbird are threatened in any way. Indeed, it has been suggested that Gibberbirds may have benefited from modification of arid-zone vegetation through pastoral activity, although the evidence for this is fairly scant.

Continuing pressure of urban development, weed infestation, introduced predators and overgrazing are likely to have detrimental effects on certain species, particularly those in coastal and subcoastal areas. Cats and other introduced predators are known to take some epthianurid species, and some of these birds are killed by vehicles. Vehicles and the trampling of vegetation by grazing stock also destroy nests, but it is not known to what extent this has affected populations. The establishment of permanent water sources such as bores and overflows in arid regions may have benefited some species, particularly the Yellow Chat, but the extent to which this is counteracted by degradation of vegetation by livestock remains unknown.

### General Bibliography

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PLATE 49

## PLATE 49

## Family EPTHIANURIDAE (AUSTRALIAN CHATS) SPECIES ACCOUNTS

### Genus *EPTHIANURA* Gould, 1838

#### 1. Crimson Chat

##### *Epthianura tricolor*

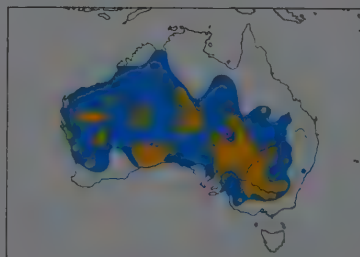
**French:** Epthianure tricolore **German:** Scharlachtrugschmätzer **Spanish:** Eptianuro Tricolor  
**Other common names:** Red-breasted Chat, Crimson-breasted Nun, Saltbush Canary

**Taxonomy.** *Epthianura tricolor* Gould, 1841, Australia, 'Hab.?' = Peel River, New South Wales, Australia.

Genus name often spelt erroneously as *Ephthianura*. Genus was in the past sometimes placed in thornbill family (Acanthizidae), and more recent analyses of DNA-DNA hybridization indicate that it belongs with the honeyeaters (Meliphagidae); further study required. Monotypic.

**Distribution.** Australia, mainly in interior, with few records from N tropics.

**Descriptive notes.** 11–13 cm; 9–14 g. Distinctive Australian chat with scarlet or reddish uppertail-coverts in all plumages. Male in breeding plumage has forehead, crown and nape scarlet; lores and broad band back to neck side dark brown, this colour extending down to side of upper breast;



upperparts brown, except for scarlet uppertail-coverts; upperwing mostly dark brown, with narrow white outer edges and broad tips on median and greater secondary coverts, narrow white fringes on alula, greater primary coverts, tertials and secondaries, and narrow white fringes at tips of primaries; tail blackish-brown, feathers with narrow white outer edges and tips (more obvious in flight); chin and throat white; underparts mostly scarlet, lower belly, thighs and undertail-coverts white, sometimes with scarlet mottling; underwing-coverts and axillaries pale brownish-grey; iris pale yellow to whitish; bill and legs black to dark grey. Male in non-breeding plumage (mainly Apr–Jun) is less extensively scarlet on top of head and underparts, and has paler brown facial mask, neck and side of upper breast. Female differs from male in having top and side of head, neck and side of upper breast light brownish, sometimes with faint orange or pinkish tinge on forehead and crown, and whitish underparts with pinkish mottling on lower breast, belly and flanks. Juvenile is similar to female, but has dull orange uppertail-coverts, lacks red or pink colour below, and has broad buff fringes on all upperwing feathers; immature very similar to adult. **VOICE.** Mournful "tee-who" or strong oscillating calls given by territorial

male, also bill-clicking in agonistic display. Chattering, metallic or nasal notes given by flocks and in flight; sweet "see" whistle as alarm or contact call.

**Habitat.** Open chenopod shrublands, or shrublands dominated by acacia (*Acacia*, especially *mulgas*), *Grevillea*, *Hakea* and *Eremophila*, in arid or semi-arid regions, and occasionally in temperate or subtropical regions; occurs also in grasslands, particularly those dominated by spinifex (*Triodia*) or Mitchell grass (*Asprella*), and sometimes in woodland. Often on plains, along watercourses, on dunes or edges of saltlakes, and occasionally on agricultural land.

**Food and Feeding.** Eats insects, including beetles (Coleoptera), grasshoppers (Orthoptera), bugs (Hemiptera), butterflies (Lepidoptera) and ants (Hymenoptera); also arachnids, nectar, fruits and seeds. Drinks water, including dew. Often forages on ground or probes among foliage or flowers of low shrubs. Usually in small groups or flocks of up to 30 individuals, sometimes in mixed-species flocks with other chats.

**Breeding.** Usually Jul/Aug–Nov/Dec, sometimes in other months after good rainfall in arid regions. Breeds in pairs; both sexes take part in nest-building, defence of nest territory, incubation and rearing of young. Nest a neat, small cup made from grass, fine stems, bark fibre, feathers and rootlets, often bound with hair, feathers, often those of Emu (*Dromaius novaehollandiae*), soft seeds and plant down; placed 0–120 cm (usually not above 40 cm) above ground, usually in low shrub, typically saltbush (*Atriplex*), bluebush (*Maireana*) or samphire (*Halosarcia*, *Sarcocornia*), but sometimes in cluster of spinifex, tall grasses, small tree, among dead branches on ground or in introduced tall weeds such as thistles or horchound (*Marrubium vulgare*). Clutch 2–4 eggs, rarely 5; incubation period 10–14 days; nestling period 9–11 days. Rarely, nests parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Hatching success c. 65% and fledging success 20–26%; introduced foxes (*Vulpes*) sometimes destroy nests, and cats may kill nestlings.

**Movements.** Highly nomadic, local numbers fluctuating enormously. Seasonal trends poorly understood and unpredictable; in breeding range in SE & SW, usually recorded in spring–summer and particularly in years of high rainfall; in N parts of range, such as Kimberley region of Western Australia and in N Queensland (excluding Cape York Peninsula), usually recorded as non-breeding visitor in autumn–winter (dry season). In C parts, including N South Australia and arid Western Australia, most numerous after good rainfall; drought conditions in C Australia apparently lead to large-scale movements to coastal or S regions.

**Status and Conservation.** Not globally threatened. Locally common. Densities of up to 3–7 birds/ha recorded at L Disappointment, in Western Australia. Successfully bred in captivity.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Chandler (1929), Clayton *et al.* (2006), Davies *et al.* (1988), Davis (1999), Harrison (1974b), Higgins *et al.* (2001), Hobbs (1961), Johnstone & Keast (1958c), Kolichis (1992), McAllan & Bruce (1989), Milhinch (1983), Schodde & Mason (1999), Shephard (1989), White (1950a), Williams (1979).

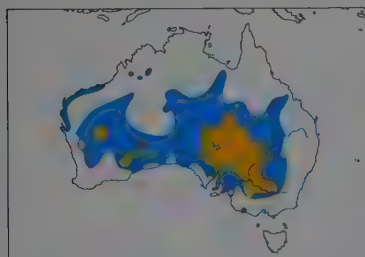
## 2. Orange Chat

### *Ephthianura aurifrons*

**French:** Ephthianure orangée **German:** Goldstirn-Trugschmätzer **Spanish:** Eptianuro Naranja  
**Other common names:** Orange-breasted/Orange-fronted Chat, Orange-fronted Nun, Tang, Saltbush Canary

**Taxonomy.** *Ephthianura aurifrons* Gould, 1838, Gammon Plains, New South Wales, Australia. Genus name often spelt erroneously as *Ephthianura*. Genus was in the past sometimes placed in thornbill family (Acanthizidae), and more recent analyses of DNA–DNA hybridization indicate that it belongs with the honeyeaters (Meliphagidae); further study required. Monotypic.

**Distribution.** Australia, mainly in interior, with few records from N tropics.



**Descriptive notes.** 11–12 cm; 8–13 g. Distinctive Australian chat with yellow upperpart-coverts in all plumages. Male has forehead rich orange, grading to yellow on crown, eyering, ear-coverts and side of neck; nape, hindneck and most of upperparts yellow-olive, dark brown mottling or streaking on nape, mantle, back and scapulars; bright yellow upperpart-coverts; upwings dark brown to blackish-brown, with yellow-white or whitish fringes on alula and all wing-coverts, tertials with yellow-white fringes, primaries and secondaries with narrow yellow outer edges, and primaries with narrow white fringes at tips (when fresh); rectrices blackish-brown, paler on undersurface, with narrow white tips; lores, chin and throat black, forming distinct black mask; underparts orange-yellow or rich yellow, with fine dark brown streaks on upper flanks; underwing greyish, axillaries yellow; iris reddish-brown or orange; bill and legs black to greyish-brown. Female lacks black facial mask and rich orange plumage, has top of head, neck and upperparts greyish-brown with fine dusky streaking, ear-coverts light brownish with yellow tinge, lores and chin whitish, grading to pale yellow on throat, eyering and supercilium; upwings as male, but median secondary coverts and tertials fringed light brownish and greater secondary coverts fringed brownish-white; underparts paler yellow, with light brown wash at breast side and fine brown streaking on breast and upper flanks; bill usually paler brown at base. Juvenile is similar to female, but fringes of tertials and upwings-coverts broader and richer buff-brown, and underbody much paler yellow or whitish, with buff wash across breast, bill brownish with dusky tip, gape yellow, legs brownish-orange; immature very similar to adult female. Voice. Not well known. Weak metallic song or rising metallic rasp given from top of shrub. Metallic "tang" or mellow "cheek cheek" in flight; soft "shu-shu-shu" during broken-wing display.

**Habitat.** Open chenopod shrublands and stony areas of arid or semi-arid regions, occasionally in coastal or near-coastal regions. Often in samphire vegetation around edges of saltlakes; sometimes in low mulga (*Acacia*) woodland or tall shrubland dominated by *Eremophila*, *Grevillea* and other species. Occasionally recorded in spinifex (*Triodia*) or other grassland, but rarely on agricultural land.

**Food and Feeding.** Eats insects, including small grasshoppers (Orthoptera), beetles (Coleoptera), caterpillars (Lepidoptera) and flies (Diptera); also small spiders (Araneae), and vegetable matter. Apparently no records of feeding on nectar. Rarely drinks water. Forages on ground or in low shrubs. In pairs or small groups, at times in larger flocks; sometimes in mixed-species parties, including those with other chats.

**Breeding.** Breeds in most months except May–Jun, but usually Aug–Nov; sometimes three or more nestings in a year. Breeds in pairs; both sexes take part in nest-building, and both defend nest

territory, incubate eggs and rear young. Nest, built mostly by female, a small cup constructed from fine twigs, rootlets, grass, feathers and, in coastal areas, sea-grass (*Posidonia*), bound with hair, wool, spider egg sacs, feathers and fine grasses and rootlets; placed 10–30 cm above ground, sometimes on ground, and usually in low shrub, typically saltbush (*Atriplex*), bluebush (*Maireana*) or samphire (*Halosarcia*, *Sarcocornia*), sometimes in cluster of spinifex, canegrass (*Eragrostis*) or lignum (*Muehlenbeckia*). Clutch usually 3 eggs, sometimes 2 or 4; incubation period 11–12 days; nestling period c. 10 days. Nests sometimes parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*). Hatching success c. 64%, but no information on fledging success.

**Movements.** Nomadic, but some seasonal trends noted; in a few regions present throughout year, though numbers vary. Major irruptions sometimes occur at edges of range during drought conditions. In arid and semi-arid regions, abundance usually greatest after good rains; abundance highest in interior Western Australia after good summer or autumn rains, and not often recorded during spring to early summer; in Victoria and S South Australia usually recorded only in spring–summer, seldom in winter.

**Status and Conservation.** Not globally threatened. Locally fairly common. Densities of 0.72 birds/ha at Cunumulla (Queensland) and exceeding 0.06 birds/ha near Broken Hill (New South Wales). Said to have been resident in Riverina region of New South Wales, but now irregular visitor there following dieback of saltbush. Has bred successfully in captivity.

**Bibliography.** Anon. (1981), Barrett *et al.* (2003), Beruldsen (1980), Blakers *et al.* (1984), Clayton *et al.* (2006), Cleland (1922), Cody (1991), Harrison (1974b), Higgins *et al.* (2001), Hindwood (1940a), Hobbs (1961), Johnstone & Keast (1958c), Keast (1958c), McAllan (1989), McAllan & Bruce (1989), McGilp (1923), Richards (1982), Schodde & Mason (1999), Shephard (1989), Smith (1997), Stephens (1983), Williams (1979), Williams & Main (1976).

## 3. Yellow Chat

### *Ephthianura crocea*

**French:** Ephthianure à collier **German:** Safrantrugschmätzer **Spanish:** Eptianuro Amarillo  
**Other common names:** Yellow-breasted Chat

**Taxonomy.** *Ephthianura crocea* Castelnau and E. P. Ramsay, 1877, Norman River, Queensland, Australia.

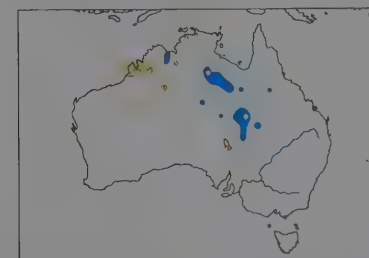
Genus name often spelt erroneously as *Ephthianura*. Genus was in the past sometimes placed in thornbill family (Acanthizidae), and more recent analyses of DNA–DNA hybridization indicate that it belongs with the honeyeaters (Meliphagidae); further study required. Proposed race *boweri* (King Sound and R Fitzroy, in N Western Australia) now considered synonymous with nominate. Three subspecies recognized.

**Subspecies and Distribution.**

*E. c. tunneyi* Mathews, 1912 – NW Northern Territory (W Arnhem Land).

*E. c. crocea* Castelnau & E. P. Ramsay, 1877 – N Western Australia (SW & NE Kimberley region, King Sound and R Fitzroy) E patchily to E Northern Territory (Barkley Tableland) and W Queensland, thence S to NE South Australia (Fromanga–L Eyre Basin).

*E. c. macgregori* Keast, 1958 – lower Dawson–Mackenzie Basin, in CE Queensland.



**Descriptive notes.** 11–12 cm; 7–10 g. Distinctive yellowish chat. Male nominate race in breeding plumage is unmistakable: has most of head and neck orange-yellow or bright yellow with narrow black lateral stripe; yellow-olive nape, hindneck and mantle to rump, with fine brown streaks on mantle, back and scapulars; uppertail-coverts orange-yellow; upwings dark brown, wing-coverts with narrow yellow or yellow-white fringes (forming pair of obvious wingbars on median and greater coverts), tertials with broad white fringes, primaries and secondaries with narrow yellow outer edges and narrow white fringes at tips;

rectrices black-brown, central pair with narrow yellow fringes, remaining pairs with narrow white tips and yellow outer edges; underbody orange-yellow or bright yellow, distinctive black crescent across centre of upper breast; underwing-coverts and axillaries yellow-white; iris whitish, cream or light brownish-grey; bill, gape and legs black to grey-black or brownish. Male non-breeding is similar to breeding-plumaged male, but differs in having olive-grey ground colour on top of head, neck and upperparts (to rump), yellowish-white face, ear-coverts and narrow supercilium, no black lateral stripe; below, paler yellow or whitish with scattered yellow patches, with diffuse blackish or dark brown crescent or small smudge on upper breast; bill paler grey or pinkish-brown at base. Female is similar to non-breeding male, but lacks dark breast mark; differs from very similar female *E. aurifrons* mainly in pale iris, whitish (not brownish) fringes of median and greater upwings-coverts, olive-grey (rather than greyish-brown) head top, ear-coverts and most of upperparts. Juvenile is very similar to female, but iris greyish and gape yellow; immature probably difficult to separate from adult. Race *tunneyi* in breeding plumage is similar to nominate, but yellow or yellow-orange colour richer, and male has slightly broader black crescent across breast; *macgregori* is apparently similar to nominate, but breeding male has darker yellowish-olive upperparts with streaks obscure, richer yellow-orange underparts, broader black breast-crescent. Voice. Song, often given by male when perched, a high-pitched "tee-tsu-tee" or "pee-ee", individual notes varying in pitch; metallic "tee-tee-tee" by male in display-flight. Occasional other calls include nasal "nang", and churring notes during broken-wing display.

**Habitat.** Low vegetation surrounding ephemeral wetlands, including samphire and freshwater swamps, bore overflows, saltlakes, sewage ponds and floodplains, in arid, semi-arid and tropical regions; sometimes in open acacia (*Acacia*) or eucalypt (*Eucalyptus*) woodlands with lignum (*Muehlenbeckia*), grassy or chenopod understorey. In NW Australia, has been recorded in tall *Sporobolus* grasslands associated with semi-permanent subcoastal wetlands; in N tropics, occasionally occurs at edges of mangrove stands.

**Food and Feeding.** Food mainly insects, including ants (of family Formicidae), beetles (of family Chrysomelidae), moths and caterpillars (Lepidoptera) and flies (Diptera); also arachnids. Often forages on wet ground, and also in small shrubs and grasses. Forages singly or in small flocks; sometimes in mixed-species parties, including those with *E. aurifrons*.

**Breeding.** Recorded in all months except Feb, Aug and Sept. Little information on bonds and breeding behaviour. Nest a small cup made of grasses or fine stems, and sometimes spider egg sacs or feathers, lined with fine rootlets, feathers, hair and spider egg sacs; placed up to 1.2 m above



ground in clump of grass or sedge, low shrub or lignum, sometimes in flooded area. Clutch 3 eggs; no information on incubation period; young fed by both sexes, nestling period 11–12 days.

**Movements.** Not understood. Probably largely nomadic, and locally and/or seasonally common at some localities in Kimberley region of Western Australia; thought to be resident at some locations, e.g. Roeback Plains (Western Australia) and Coorabulka Station (SW Queensland). Leaves wetlands and bore overflows as they dry out.

**Status and Conservation.** Not globally threatened. Locally fairly common to rare; rarer and more locally distributed than other members of family. Some concern for certain populations. Nominate race considered "vulnerable" in Queensland and "rare" in South Australia, and there are unconfirmed records of this race from inland New South Wales; sinking of artesian bores may have resulted in expansion of range to SW Queensland since 1890s; historical records from Gulf of Carpentaria region, but not recorded there since 1930s. E Queensland race *macgregori* "critically endangered"; thought to be extinct after c. 1917, but recorded on Curtis I in 1993, and more recently from several mainland sites in Fitzroy River Basin and Broad Sound, N of Rockhampton; no published breeding records of this race, and fieldwork is required. Race *tunneyi* is considered "endangered" in Northern Territory. Excessive grazing by livestock, as well as weed infestation, may adversely affect populations of this species.

**Bibliography.** Barrett *et al.* (2003), Black *et al.* (1983), Blakers *et al.* (1984), Eckert & Ludewigs (2003), Ford & Parker (1972, 1974), Higgins *et al.* (2001), Horton (1975, 1982), Juensch & Vervest (1990), Johnstone & Storr (2005), Keast (1958c), McAllan & Bruce (1989), Reynolds *et al.* (1982), Schodde & Mason (1999), Strong & Fleming (1987), Williams (1979), Woodall (1982).

#### 4. White-fronted Chat

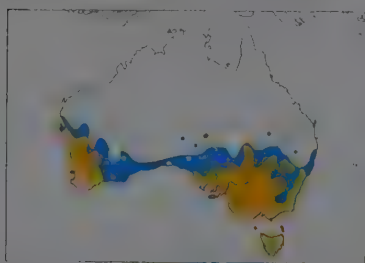
##### *Epthianura albifrons*

**French:** Epthianure à front blanc **German:** Weißgesicht-Trugschmätzer **Spanish:** Eptianuro Pio  
**Other common names:** White-faced Chat, White-fronted Bushchat, Tang

**Taxonomy.** *Acanthiza albiglans* Jardine and Selby, 1828, New Holland = New South Wales, Australia.

Genus name often spelt erroneously as *Ephthianura*. Genus was in the past sometimes placed in thornbill family (Acanthizidae), and more recent analyses of DNA-DNA hybridization indicate that it belongs with the honeyeaters (Meliphagidae); further study required. Tasmanian birds exhibit tendency towards larger size (mainly bill) than those from mainland Australia; described as a race, *tasmanica*, but differences slight and recognition of geographical races considered unwarranted. Monotypic.

**Distribution.** S Western Australia (S from c. 23° S in far W) E to South Australia (mainly S of 30° S), New South Wales, Victoria and Tasmania.



**Descriptive notes.** 11–13 cm; 11–17 g. Distinctive Australian chat with rather robust body. Male has most of head and upper breast white; rear crown, nape and hindneck black, this colour continuing as broad black band down side of neck and across lower breast; most of upperparts light grey with faint dark brown streaking, uppertail-coverts black; upperwing blackish (becoming brown with wear), tertials with fine whitish fringes when fresh; rectrices blackish, all except innermost pair with broad white tips on inner webs; belly to undertail-coverts white, thighs blackish; underwing-coverts and axillaries blackish-brown or dark

brown; iris orange or reddish to buff or light greyish; bill, gape and legs black or grey. Female differs from male in having top and sides of head and neck light greyish, short white supercilium, narrow white eyering; most of upperparts light brownish-grey with fine brown mottling, uppertail-coverts dark brownish, upperwing dark brown, light brown fringes on median and greater coverts, alula, tertials, secondaries and inner primaries, narrow whitish outer edge and fringe around tip on outer primaries; rectrices black-brown, white tips slightly narrower than on male; chin and throat white, most of underbody whitish, but breast side and flanks brownish-grey or buff, and broad blackish-brown crescent across centre of breast; axillaries and underwing-coverts brownish-grey. Juvenile is similar to female, but head top to neck and upperparts grey-brown or light brownish, underbody whitish with diffuse, narrow brownish breastband, upperwing-coverts and tertials with broad light brown fringes, primaries and secondaries with narrow light brown outer edges, iris pinkish-brown to buff, cream or light grey, gape yellow; immature similar to adults of corresponding sex, upperwing of young male often showing contrast between black (replaced in moult) and dark brown (retained juvenile) feathers. Voice. Distinctive nasal "tang", rather like call of Zebra Finch (*Taeniopygia guttata*), often given in flight; sometimes a plaintive piping call or sharp "whit whit" in display-flight.

**Habitat.** Mainly open treeless habitats, such as grasslands, low shrublands and low vegetation usually less than 1 m tall surrounding wetlands, in temperate and semi-arid regions. Often in samphire or chenopod shrublands, rank vegetation surrounding freshwater wetlands, coastal dune vegetation, sandy beaches, roadside vegetation, farmland, and recreation sites such as golf courses; occasionally in heath, woodland or open forest in early stages of regeneration after fire or clearance.

**Food and Feeding.** Eats mostly insects, including beetles (Coleoptera), bugs (Hemiptera), flies (Diptera), ants and bees (Hymenoptera), caterpillars and adult moths (Lepidoptera) and grasshoppers (Orthoptera); also spiders (Araneae), and occasionally small gastropods (Mollusca), springtails (Collembola, of family Isotomidae) and isopods (Crustacea); sometimes seeds, nectar or fruit, including seeds of acacias (*Acacia*). Occasionally drinks water. Usually takes food from ground or in low shrubs, sometimes also from shallow water; sometimes by sallying for aerial insects. Forages singly or in small groups, occasionally in flocks of more than 50 individuals; sometimes in mixed-species flocks.

**Breeding.** Jun–Jan, sometimes in other months; in arid regions usually dependent on good winter rainfall, but can breed in late summer and autumn if conditions suitable. Breeds in simple pairs.

Nest built by female, a deep cup made from grass, fine stems, leaves, rootlets, and sometimes other materials such as wool or sea-grass (*Posidonia*), usually lined with fine grass, rootlets, feathers, wool and hair, generally less than 1 m above ground in low shrub, clump of grass or sedge, sometimes on ground. Clutch 2–4 eggs, usually 3, rarely 5; incubation by both sexes, period 13–14 days; chicks fed by both sexes, nestling period 10–15 days. Nests occasionally parasitized by Horsfield's Bronze-cuckoo (*Chrysococcyx basalis*) and rarely by Fan-tailed Cuckoo (*Cacomantis flabelliformis*). Hatching success c. 60% and fledging success c. 25%.

**Movements.** Not fully understood. In many areas, species occurs throughout year and considered resident or sedentary; seasonal visitor to many other areas, including Swan Plain, in Western Australia, where fairly regular in summer–autumn; in other areas considered nomadic or irregular visitor, e.g. occasional records from SW Queensland. Possibly moves inland during good winter rains.

**Status and Conservation.** Not globally threatened. Fairly common. May have benefited from clearance of woodland for agriculture; urban and industrial development in Sydney region of New South Wales has led to declines there.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Higgins *et al.* (2001), Hobbs (1961), Johnstone & Storr (2005), Keast (1958c), Kolichis (1992), Major (1991a, 1991b, 1992), Masters & Milhinch (1974), McAllan & Bruce (1989), Schodde & Mason (1999), Watson (1955), Wheeler (1950), Williams (1979), Williams & Main (1976).

#### Genus *ASHBYIA* North, 1911

##### 5. Gibberbird

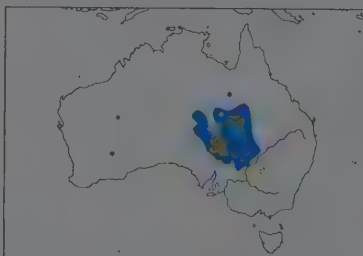
##### *Ashbyia lovensis*

**French:** Epthianure d'Ashby **German:** Wüstentrugschmätzer **Spanish:** Eptianuro de Ashby  
**Other common names:** Desert/Gibber Chat, Desert Bird

**Taxonomy.** *Ephthianura lovensis* Ashby, 1911, Leigh Creek, South Australia.

Genus was in the past sometimes placed in thornbill family (Acanthizidae), and more recent analyses of DNA-DNA hybridization indicate that it belongs with the honeyeaters (Meliphagidae); further study required. Monotypic.

**Distribution.** Extreme S Northern Territory and SW Queensland S to N South Australia and NW New South Wales.



**Descriptive notes.** 11–14 cm; 14–20 g. Distinctive Australian chat with robust body, short primary projection and rather heavy bill. Male has top of head, ear-coverts and neck light brownish-grey, forehead and ear-coverts washed yellow, yellow lores and supercilium; upperparts pinkish-brown with diffuse dark brown streaking; upperwing dark brown, tertials and all secondary wing-coverts with broad pink-brown fringes (forming pair of wingbars on median and greater coverts), primaries and secondaries with buff outer edges and narrow white fringes at tips; rectrices dark brown with narrow buff or whitish tips, outermost feather pair with distinct white outer edges; chin, throat and underparts yellow, faint pinkish-brown wash on breast side and flanks; underwing-coverts and axillaries yellowish-white; iris pale yellow to cream or white; bill and gape blackish or dark grey; legs dark grey or brownish, often with pinkish tinge. Female is similar to male, but yellow areas paler, top of head and upperparts pinkish-brown, and pinkish-brown wash often extends across breast. Juvenile is similar to female, but with buff lores and faint supercilium, whitish chin and throat, and pale yellow or flesh-coloured gape; immature not separable from adult in the field. Voice. Clear sweet ascending or descending piping song. One or more sharp "whit" notes given in alarm or display.

**Habitat.** Sparsely vegetated stony or gibber deserts in arid regions, including very open shrubland-grassland with saltbush (*Atriplex*), bindyi (*Sclerolaena*) and Mitchell grass (*Astrelba*); occasionally on claypans with open saltbush vegetation.

**Food and Feeding.** Eats mostly insects, including beetles (Coleoptera), bugs (Hemiptera), ants (of family Formicidae) and caterpillars (Lepidoptera); also seeds, including those of grasses, and vegetable matter. Forages on ground, singly or in twos, occasionally in small groups.

**Breeding.** Poorly understood. Breeding recorded in all months, usually Sept–Oct, possibly nesting after good rains. Apparently breeds in simple pairs, and both sexes take part in nest-building, incubation and the rearing of young. Nest a deep cup made from fine stems, grass, rootlets and sometimes feathers or hair, lined with rootlets, fine grass and other plant materials such as flowerheads of daisies (Compositae), placed in shallow depression in ground. Clutch 2–4 eggs, usually 3 in good seasons; no information on duration of incubation and fledging periods. Hatching success 50% for four eggs in two nests.

**Movements.** Not understood. Possibly partly nomadic; in some areas, fairly common after good rains and scarce during drought. Possibly capable of long-distance movements, as vagrants in SC Western Australia were more than 1000 km from nearest area where regularly recorded (in South Australia).

**Status and Conservation.** Not globally threatened. Uncommon. Has possibly benefited from introduction of stock in NE South Australia, through modification of habitat and increased insect larvae in winter.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Boehm (1957), Higgins *et al.* (2001), Keast (1958c), Kloot (1998), Love (1917), McAllan & Bruce (1989), McGilp (1919, 1921), Parker (1980a), Rose (1999), Schodde & Mason (1999), Schrader (1976), Smith (1973), White (1917), Wilson (1974), Woodhouse (1974).





## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family NEOSITTIDAE (SITTELLAS)



- Small, dumpy passerines with short tail, disproportionately long and broad wings, dagger-shaped or slightly upturned bill, and rather short legs with long toes; one species mostly black, the other brown and white with variable streaking.
- 10–14 cm.



- Australia and New Guinea.
- Forest and woodland, one species in montane rainforest.
- 1 genus, 2 species, 14 taxa.
- No species threatened; none extinct since 1600.

## Systematics

Like the Australasian treecreepers (Climacteridae), the sittellas (Neosittidae) provide a striking illustration of parallel evolution between an ancient Australasian endemic oscine family and another, distantly related, largely Northern Hemisphere family. Indeed, the close resemblance of sittellas to the nuthatches (Sittidae) in both morphology and climbing locomotion was so impressive that the sittellas were considered to belong in the nuthatch family until as recently as 1967. Over a decade earlier E. Mayr had questioned their placement in Sittidae, because of differences in their nests and sociality. Sittellas build a beautifully camouflaged, deep cup-shaped nest in a vertical forked branch and are highly social, co-operatively breeding birds, whereas nuthatches nest in tree holes and most species breed as simple pairs. Anatomical studies in 1977 showed that, despite the very close similarity between the sittellas and the nuthatches in climbing techniques, sittellas are much more similar in leg musculature to the Australasian honeyeaters (Meliphagidae) than to the nuthatches.

Although checklists drawn up in the 1950s and 1960s placed the sittellas variously among the babblers (Timaliidae), the Holarctic and Afrotropical treecreepers (Certhiidae) and the Australasian treecreepers, the true affinities of this tiny family remained unclear. On the basis of similarities in egg coloration, juvenile plumage and nest structure, S. A. Parker proposed that sittellas could have arisen from the ancestors of the Australasian robins (Petroicidae), the whistlers (Pachycephalidae) or the monarch-flycatchers (Monarchidae). Soon afterwards, the studies undertaken by C. G. Sibley and J. E. Ahlquist on DNA–DNA hybridization seemed to vindicate Parker's proposal, indicating that the closest living relatives of the sittellas were the whistlers and the monarchs. Consequently, these authors placed sittellas in a monogeneric tribe, Neosittini, within a subfamily Pachycephalinae of the outsize family Corvidae. The most recent phylogenetic analysis of oscine passerines, based on mainly molecular data-sets, places the sittellas in a clade of their own, closest to the berrypeckers and longbills (Melanocharitidae) of New Guinea, and closer to the whistlers than the monarchs. While the affinities of sittellas are thus still uncertain, there now seems little doubt that their morphological and locomotory similarities to the nuthatches are due entirely to evolutionary convergence resulting from adaptations for bark-foraging.

The historical "identity crisis" suffered by the family as a whole also characterizes the species within it. The Varied Sittella

(*Daphoenositta chrysoptera*) was first described from Sydney, south-east Australia, in 1801, under the name of the "Orange-winged Nuthatch (*Sitta chrysoptera*)". When it became clear that it did not belong within *Sitta*, a separate genus was required, and *Sittella* was thus erected by W. Swainson in 1837. However, this name turned out to be preoccupied by an 1815 synonym for *Sitta*, as a result of which the Australasian genus was renamed *Neositta* by C. E. Hellmayr in 1901. In the meantime, in 1896, the Black Sittella (*Daphoenositta miranda*) had been discovered in south-east New Guinea, and placed in a separate new genus, *Daphoenositta*. Moving forward once again, to 1904, R. Ridgway coined the first family-group name for these birds, when he included both *Neositta* and *Daphoenositta* in his subfamily Neosittinae. Subsequently, from the 1960s onwards the two genera were increasingly considered more suitably lumped into a single genus, in which case the older name, *Daphoenositta*, has priority. Thus, the sittellas end up with the unusual situation whereby the oldest valid name for the family, Neosittidae, is based on a genus currently subsumed into the older genus name *Daphoenositta*. A. L. Rand already attempted to oust the name Neosittinae way back in 1936, proposing Daphoenosittinae as a replacement, on the grounds simply that *Daphoenositta* was the older genus name, but there is no nomenclatural justification for such a change. Indeed, despite the evident awkwardness of the current situation, the International Code of Zoological Nomenclature is quite clear on the issue, to the extent that the particular case of Neosittidae is the very one cited within the text of the Code to exemplify the principle that the valid family-group name need not be based on the oldest available genus name.

The five distinctive, allopatric Australian subspecies of the Varied Sittella were generally considered to represent five separate species until 1950, when Mayr claimed that almost all forms interbred where their ranges abutted on one another, and that they should, therefore, be treated as members of one and the same species. Since then, hybridization has been confirmed between all contiguous forms, culminating in the discovery of five-way hybridization in central Queensland, where all subspecies meet, involving the segregation and recombination of at least ten different morphological characteristics.

The Papuan forms of the Varied Sittella are similarly variable. Although they are sometimes treated as a separate full species, the "Papuan Sittella (*Daphoenositta papuensis*)", because of their lack of a distinct wingbar and their confinement to montane forests, they are fairly similar in body plumage, bill col-

The two species of *sittella* are small, dumpy, short-tailed passerines with a dagger-shaped or slightly upturned bill. They have broad wings, short legs, and small feet, but the toes are rather long—an adaptation to a life spent clinging onto trees. Unlike the case of most climbing birds, the hind toe of the **Varied Sittella** is curved.

When climbing, *sittellas* hold the body at an oblique angle to the trunk, keeping their feet parallel and widely spread, and ascend in a series of hops, lifting both feet simultaneously.

[*Daphoenositta chrysoptera pileata*, Dadswells Bridge, W Victoria, Australia. Photo: Jon Thornton]



our, and in habitat elevation to the north-east Australian subspecies *striata*, to which they were probably linked during one of the most recent ice ages. Thus, the Papuan forms are usually treated as subspecies of the highly polytypic Varied Sittella. Driven to the tops of the mountains during past glacial episodes, each form in New Guinea must have differentiated as a result of its geographical isolation from populations on other mountain ranges. Whether the morphologically intermediate forms represent hybrid zones can be resolved only by further fieldwork and analyses of DNA.

The Black Sittella was first discovered by A. Giulianetti while he was collecting for William MacGregor on Mount Scratchley, in the Wharton Range of south-east New Guinea, in 1896. Subsequent specimens were collected by H. A. Lorentz, in 1909, and by members of the American Museum Papuan Expedition, in 1933. Sadly, even many decades later, it remains a fact that very little is known about this species, which is confined to the mountains of central and south-east New Guinea.

### Morphological Aspects

Sittellas are small, somewhat dumpy, short-tailed oscines with a dagger-shaped or slightly upturned bill. The body length of the Varied Sittella ranges from 10 cm to 14 cm, and its weight from 8 g to 20 g, with the nominate race typically 10–14 g in weight. The Black Sittella is normally slightly larger and heavier. The wings are disproportionately long and broad, the tips of the folded primaries falling just beyond the tip of the tail; when the wing is spread, it shows a strongly curved trailing edge and distinctly fingered tips. The wing has ten primaries, the outermost of which is reduced, and nine secondaries, including three tertials and a vestigial innermost secondary. The short, squared tail has twelve rectrices. The legs are rather short, with scaling at the front (laminipantar scutulation), and the toes, especially the middle and hind toes, are long, the hind toe having the longest claw. True to their English vernacular names, the Black Sittella is largely black, with a bright pink face, and the Varied Sittella is highly variable in plumage, with streaked or unstreaked grey or brown upperparts, white or streaked underparts and, in Australia, a cinnamon-orange or white wingbar which is conspicuous in flight.

With five well-known subspecies in Australia, and four to six poorly known subspecies in New Guinea, the Varied Sittella is one of the most polytypic avian species in the Australo-Papuan region. In Australia the five subspecies differ in many ways, in-

cluding body size, the amount of streaking on the upperparts and underparts, the colour and extent of the wingbar, and the length and colour of the bill. Variation in these characters exhibits distinct and independent east–west and north–south trends. The two northern subspecies, for example, differ from the three southern ones in wingbar and bill characters, whereas the three eastern forms differ from the two western forms in the amount of ventral streaking. With the sole exception of the white-headed subspecies *leucocephala*, there is also sexual dimorphism, but it is confined to the head. Males have a black or brown cap and white, greyish or streaked eyebrows, lores and ear-coverts, whereas females invariably have the black extending to the face and chin and, in the subspecies *striata*, reaching the lower throat.

In New Guinea, however, the principal differences between subspecies are the head markings, and, given that the sexes differ in the same character, the validity of some subspecies is questionable. In contrast to the Australian subspecies, males of most Papuan races tend to be darker-headed than the females, having a black head with or without white scalloping, whereas the females' head is white or grey with dark streaks. An exception to this is the race *alba*, in which the male has a white head, but the full implications are uncertain because the female remains unknown for the present. Curiously, sexual dimorphism in the Black Sittella is evident only in respect of the bare parts, the eyes and legs of males being dark and those of females yellow.

Among Australian races of the Varied Sittella, the bill and wings of males are slightly longer than are those of females, but there are no constant differences between the sexes in weight, or in the length of the tarsus or tail. In addition, the hind claw of males, at least in north-east New South Wales, is more curved than that of females.

As pointed out by Parker, in 1982, the distinctively pale-spotted juveniles of sittellas bear an uncanny resemblance to those of several Australasian robins, particularly those of the genera *Microeca* and *Petroica*. Juvenile Varied Sittellas have white or pale buff feather tips, in the shape of a rose thorn, on the crown and mantle, and similar salmon-coloured, rufous-orange or creamy tips on the upperwing-coverts and flight-feathers. In the all-dark Black Sittella, likewise, juveniles have the feathers of the upperparts, underparts and wings tipped cinnamon-brown. The pale markings on the crown and mantle of the Varied Sittella are gradually moulted as the juvenile acquires its immature, or first basic, plumage, which it does within three months after fledging, but the pale-edged greater primary coverts, remiges and rectrices are retained for 5–10 months, until the first full adult moult.





With as many as eleven races in Australia and New Guinea, the **Varied Sittella** is markedly polytypic. The five Australian subspecies differ in the amount of streaking, the wingbar colour and extent, the amount of dark on the head, the length and colour of the bill, and slightly in body size. The New Guinea taxa differ primarily in head markings. In addition to all these variations, the species is sexually dimorphic in plumage and some measurements. Males have a slightly longer bill and wings, while Australian females, like this one, tend to have black extending onto the face and chin.

[*Daphoenositta chrysoptera pileata*, near Melbourne, Australia. Photo: Chris Tzaros]

In contrast to the Australasian treecreepers, the foot of sittellas exhibits little structural modification for climbing. The pads on the sole of the foot are not reduced, the anterior "crests" on the proximal end of the tibiotarsus are not expanded, the toes and claws are relatively shorter, and the hind toe, or hallux, is curved dorsoventrally as on most perching birds, and not straightened as is typical of climbers. The curved hallux is an adaptation for perching on rounded substrates, such as twigs, as opposed to climbing on vertical surfaces. The third and fourth toes are united by the basal phalanx only. Like their northern ecological counterparts the nuthatches, but unlike the Australasian treecreepers, the sittellas are "reverse hoppers". In this climbing technique, the body axis is usually at an oblique angle to the trunk or branch, and the feet are held parallel, and widely spread. During climbing, either upwards or downwards, the bird proceeds in a series of hops, both feet being lifted from the substrate simultaneously. As the body is aligned obliquely, this action causes the bird to spiral around the trunk or limb. Thus, vertical movement on tree trunks is achieved by reversing the body axis at each hop.

As with the woodpeckers (Picidae), the front of the skull of sittellas bulges and there is an infolded naso-frontal hinge. In contrast to woodpeckers, and even nuthatches, however, the bill is strongly compressed laterally, and is therefore unsuited for the excavating of wood. The Varied Sittella has the tip of the tongue quadrifid (four-pronged) and unfringed, whereas that of the Black Sittella is bifid and with a short fringe, possibly for retrieving insects from clumps of epiphytic lichen (see Food and Feeding). Unlike those of nuthatches, the bristles around the base of the bill are weakly developed in the Varied Sittella; their near-absence in the Black Sittella may be an adaptation to avoid entanglement with epiphytic mosses and lichens.

### Habitat

Like the only other bark-foraging specialists in the region, the Australasian treecreepers, the family Neosittidae is confined to New Guinea and Australia, but is curiously absent from the great southern island of Tasmania. As the Varied Sittella is common in the mainland Australian state of Victoria, to which Tasmania was frequently connected during the Pleistocene ice ages, its absence

from the island is probably due to the lack of suitable forest habitat on it or its land-bridge to the mainland during these past cold, dry glacial epochs. Certainly, in today's wetter climate there is no shortage of suitable habitat on Tasmania, where various honeyeaters and other species have filled the bark-foraging niche. Perhaps, in addition, an impoverished bark-dwelling arthropod fauna contributed to the demise of any sittellas or treecreepers that may have been marooned on Tasmania before its final separation from the mainland, some 5000 years ago, with the opening up of the 200-km-wide Bass Strait.

In Australia's tropical north, however, Varied Sittellas are present on the Tiwi Islands, comprising the islands of Bathurst and Melville, a combined area of about 5000 km<sup>2</sup> and situated some 27 km from the nearest mainland, yet they are absent from Groote Eylandt, which covers about 2300 km<sup>2</sup> and lies approximately 40 km from the mainland. Both island areas were joined to the mainland during the last ice age, until approximately 6000 years ago, and both have ample suitable woodland habitat. Clearly, the Tiwi Islands are larger and closer to the mainland, but the flight of sittellas is characteristically weak (see General Habits) and it is doubtful that they could cross a sea barrier of even 27 km. Instead, their absence from Groote Eylandt may be related to the species' apparent scarcity on the adjacent mainland.

The evolution of five distinct subspecies that replace each other geographically around the continent strongly suggests that the range of the Varied Sittella in Australia was fragmented rather recently, with insufficient time for the forms to evolve into separate species. The most likely scenario is that populations were isolated from each other during the last glacial epoch, about 25,000–10,000 years before present, confined to moist refuges around the continent's periphery, and separated by large expanses of grassland or sparsely covered low woodland, both inland and on the crest of the Great Dividing Range, which was possibly 200 m higher than it is today. Progressive amelioration in the climate allowed these differentiated forms to spread from their past refugia, particularly in the case of the two western subspecies, which must have spread over 1000 km eastwards, but were presumably already preadapted to drier woodlands. Finally, the partial vacuum in central Queensland until the recent past allowed all five formerly isolated subspecies to meet and hybridize in this region, which, owing to the lack of any marked

The **Varied Sittella** is a sociable species, living in groups of up to 30 birds.

Flocks often split into subgroups for the breeding season, a social system similar to that of co-operatively breeding thornbills (*Acanthizidae*) that often share sittella habitat. This sittella quintet is huddling together at a typical roost site on a thin horizontal branch. Roosting behaviour reflects and probably reinforces the group's social relations, being highly ritualized and following the dominance ranking within the group. The breeding male leads the group to the roost-site, and usually occupies the vulnerable outermost position, where he appears to act as a look-out.

[*Daphoenositta chrysoptera pileata*, Little Desert National Park, Victoria, Australia. Photo: Peter Fuller]



environmental gradients, permits the back-crossing of hybrids with their parental gene pools.

In Australia today, the Varied Sittella is found in a broad variety of habitats, ranging from the low acacia (*Acacia*) shrublands dominating the arid interior to very tall wet eucalypt (*Eucalyptus*) forests of the south-east and south-west. Paradoxically, the one form of vegetation that it avoids in Australia, rainforest, is its exclusive habitat in New Guinea. On this exceptionally mountainous tropical island, however, neither sittella species occurs in the lowland rainforests. Here, the Varied Sittella inhabits the highland rainforests dominated by oak (*Castanopsis*) and laurel (*Lauraceae*) at around 1000 m above sea-level, and the mossy montane rainforests to as high as 2600 m, along the entire length of the central cordillera running east-west through New Guinea, including the ranges of the Vogelkop Peninsula in the west and several isolated ranges in the east. Its habitat and altitudinal range overlap slightly with those of the much more restricted Black Sittella, which is confined to moss-covered upper montane rainforests of New Guinea at elevations from 2000 m to 3600 m.

### General Habits

Being both highly sociable and seemingly hyperactive, sittellas make entertaining subjects for study. Their restless behaviour doubtless frustrated early collectors and subsequent workers searching for the Black Sittella in the remote and rugged terrain of New Guinea's highest mountains. J. M. Diamond reported that this species spends only a few minutes in a tree before flying off, usually out of sight. Although Diamond encountered the Black Sittella "always in flocks of three to five birds", A. L. Rand reported that flocks numbered six to ten individuals, adding that they "move about quickly through the forest". These descriptions apply equally well to Varied Sittellas in Australia, for which flock sizes of up to 30 have been reported, although only four of 44 groups observed in north-east New South Wales and central Queensland contained more than seven individuals. The mean group size in these regions was 5 and 4.7, respectively; simple pairs were recorded in 20% of cases. Complicating the determination of the sizes of groups, however, is the dynamic nature of their composition, as demonstrated in a study in north-east New

South Wales, where the size of four groups varied over the year from two to nine individuals, the average being 5.4 birds.

Encounter rates with sittellas are often low, this being due to their typical habit of gathering into compact, rapidly moving flocks, as well as their low population densities and presumably large home ranges in many sparsely wooded habitats, such as open savanna or shrubland. This may give the impression that the species is highly mobile, and, indeed, many have claimed that sittellas either are nomadic or undertake small-scale movements. Long-term surveys in eucalypt forests of eastern Australia, however, have shown that Varied Sittellas are sedentary, with densities typically ranging from 0.1 to 0.6 birds per hectare. Moreover, the flight of sittellas is characteristically weak and undulating, with long glides between flapping, and this makes it unlikely that they carry out long-distance movements. Unconfirmed reports of emigration and immigration at various localities, mostly in semi-arid regions, may also be related to temporal changes in their social organization, as large noisy flocks are obviously more conspicuous than pairs or small groups.

Sittellas appear to have a complex and dynamic social organization that involves two or more tiers of groups, subtle dominance hierarchies and, perhaps, a plural co-operative breeding system. Although there has been no intensive study of the social organization of these species, opportunistic observations of a local population of Varied Sittellas in north-east New South Wales, which contained several colour-ringed individuals, suggested the existence of four "clans" each of 8–12 individuals, each clan ranging over 13–20 hectares. While there was slight overlap among these home ranges, interactions between clans along borders suggested territorial defence, albeit infrequent and not particularly hostile. These clans split up into smaller units at the beginning of the breeding season and reunited during the non-breeding season, a social system similar to that of co-operatively breeding thornbills (*Acanthizidae*), which often share the sittellas' habitat. For example, one clan of eight Varied Sittellas split into two quartets, one of which broke up into pairs at the start of the breeding season; these pairs, however, after unsuccessful nesting attempts, coalesced for subsequent breeding attempts, and, finally, amalgamated with other members of the clan at the end of the breeding season.

Population sex ratios appear to be biased towards males, this being probably due in part, at least, to higher dispersal rates among



females. Among 43 adult and subadult Varied Sittellas collected from 14 or 15 groups encountered within far north-east New South Wales, males outnumbered females by 2.3 to 1. Three quartets and one sextet contained only one female each, while another sextet contained two females. Sixteen randomly collected individuals from groups in another part of the same region displayed a similar skew of 2.2 males to 1 female, and trios invariably comprised two males and a female. Several lines of evidence from the north-east New South Wales study site suggest that pre-breeding dispersal involves mainly females, males being more strongly philopatric. In one group, an unringed adult female joined and became the breeder within only six days of the death of the previous colour-ringed breeding female; within one month the new breeder expelled the 11-month-old daughter of her predecessor, a process that included repeated attacks as the younger female attempted to join the group at its roost. Another adult female which joined the group was repeatedly chased away by the breeder as it attempted to feed the latter's nestlings. In another region, the only solitary Varied Sittellas located turned out to be females. In contrast, non-breeding males at two sites remained for at least two years in the territories where they were ringed. Of two siblings colour-ringed as nestlings, the male remained in his natal territory for at least 13 months, whereas his sister disappeared soon after the start of the next breeding season, about nine months after fledging.

The activities of group-members are highly synchronized and co-ordinated, especially when flying between trees. Flight to the next tree usually takes place only after at least one individual, probably a dominant one, has given "rallying calls" (see Voice). If a subordinate individual flies from a tree prematurely, particularly in open country, it will circle back and wait until the remainder of the group is ready to fly. The group-members then fly as a cohesive unit until the next tree is approached, whereupon they spread out to forage over all parts of the tree. As all members forage simultaneously, there appears to be no sentinel system. Resting and preening are also carried out by all group-members simultaneously, each individual usually separated by 1–5 m from the others, unless engaging in mutual preening. This high level of co-ordination within the group, however, can at times seem maladaptive, as when many birds queue beside nests, anxiously and noisily waiting their turn to add building material or to feed the young.

Typically for social birds, sittellas frequently engage in mutual preening, or allopreening. This behaviour is usually seen after sittellas have spent a few minutes in self-preening. One individual

sidles up to another and preens it for a few minutes, and the other then reciprocates. Such behaviour frequently involves the breeding male and the breeding female, but mutual preening also involves breeding and non-breeding adult males, and adults and juveniles, as well as two juveniles, but apparently does not occur between adult females. In addition, juveniles are often allopreened simultaneously by two adults, one on each side; in seeking such attention, they sometimes wedge themselves between two preening adults. Because juveniles preen adults, and non-breeding males preen breeders, the direction of allopreening provides no clues as to the dominance ranking of individuals. Indeed, as sittellas are rarely hostile towards one another, it is difficult to discern a social hierarchy among group-members, at least during the day.

Although it has been known since at least 1967 that Varied Sittellas roost communally, it was not until 1980 that a detailed 12-month study of a colour-ringed group of 5–7 individuals revealed the significance of roosting behaviour in reflecting and probably reinforcing intra-group social relations. On a total of 120 nights the group used as roosts only 13 trees, scattered over the entire territory of 20 hectares, and, although it utilized one site continuously for at least 19 days, at other times it switched roost-sites frequently and unpredictably. The most frequently used roost-sites ranged in height from 9 m to 16 m, and almost all were in the upper half of the tree.

The birds always huddled at the base of a thin horizontal or slightly upwardly inclined dead branch, about 2–3 cm in diameter, on a living or dead eucalypt, with the innermost individual touching the adjoining branch, which in most cases formed a roof over the roost branch. When settled, all birds faced the same direction, each leaning head downwards and tail upwards at an angle of about 45 degrees, until it was ready to sleep, at which point it assumed a more vertical stance, with the head tucked backwards. The distinctive pre-sleeping posture seems adaptive in facilitating a quick launch. At the first sign of danger, the group "explodes" from the roost-site, individuals fleeing in all directions, making pursuit of any one bird almost impossible for a predator. The intimate physical contact between individuals that is afforded by huddling allows a quicker reaction than would be the case if the birds were spaced out.

In contrast to their behaviour when foraging, sittellas did not arrive at the roost-site simultaneously but, instead, came in at intervals of 30–60 seconds, apparently so as no to attract the attention of potential predators. After the first two settled at the base of the branch, the other group-members usually flew to the



*Sittella* vocalizations are simple, as there is no need for a wide vocal repertoire where group-members live close together and have a clear hierarchical rank. Neither *sittella* sings. The **Varied Sittella** has five distinct calls, each with a specific purpose: birds give a soft contact call when foraging; a "rallying" call marks the group's movement between trees; the incubating female and young chatter to beg for food; subordinate birds near a dominant individual, and females about to copulate, utter a wheezy "submission" call; and when startled, sittellas give a shrill alarm call.

[*Daphoenositta chrysoptera pileata*, Goschen, Victoria, Australia.  
Photo: Peter Fuller]



When foraging on trees, the Varied Sittella ascends trunks in a spiral, or descends them head first. The species climbs rapidly along the uppersides of branches, peering one way then the other, flicking open a wing to flush out cryptic prey. The commonest foraging techniques involve gleaning, or scaling the bark surface. In the latter, the bird wedges its long mandible under bark, then pivots the bill to dislodge the bark. Birds will also probe crevices, as here, or search underneath peeling bark, and occasionally sally for aerial insects.

[*Daphoenositta chrysoptera*, Australia.

Photo: Roland Seitre]

tip of the branch, hopped back towards its base, and squeezed up between any two individuals already present, gradually forcing the outer bird or birds farther along the branch. On more than one short branch, this caused the outermost individual to fall off the end. The sittellas settled to roost much earlier, and awoke later, than all other passerines observed in the study area. The mean monthly time of roosting varied from 2 minutes before sunset, in December, to 25 minutes before sunset, in July. This was 26 minutes earlier, on average, than the slightly smaller, communally roosting Striated Thornbill (*Acanthiza lineata*). Despite being the earliest to settle at their roost-site, however, the sittellas were not necessarily the first asleep, nor the first awake. At least one individual stayed awake until darkness had fallen, and the minimum elapsed time from the moment when the last bird arrived to when the last one fell asleep varied from 23 to 48 minutes, with an average of 36 minutes. On four mornings, the Striated Thornbills and nine other species were actively foraging 3 minutes before the sittellas awoke, yet the sittellas did not depart from their roost-site until 7–10 minutes later.

Amazingly, the order in which certain sittellas arrived at the roost, their positions within it and even the order in which the birds went to sleep remained highly constant from night to night. The breeding male led the group to the roost-site, and others rarely moved towards the site while he was still foraging, or, if they did, they soon lost interest. He also initiated departure when the site was abandoned for another site. The breeding male was the first to arrive, and the non-breeding male the second, on 38 of 45 nights when arrival of individuals was monitored. The non-breeder preceded the breeder on the remaining nights, but on each occasion he flew off as soon as the latter arrived. The non-breeder always approached the breeder while holding its head lowered and with its wings quivering, clearly indicating its subordinate status. The third group-member to arrive was most often the breeding female, as was the case on 30 of the 45 nights, but she was preceded by her son on most of the remaining nights. The last to arrive was usually the immature or non-breeding adult female. As the adult males were the first two to reach the roost, they almost invariably occupied the end positions of the huddle, the breeder in the outermost position in 72% of cases. The breeding female was most often beside her mate, while the youngest birds were usually in the middle. This configuration, with males in the end positions and young in the centre, was observed also at another locality where sittellas had been colour-ringed for individual identification.

While huddling behaviour is generally thought to have a thermoregulatory function, its major role for roosting sittellas may be that of ensuring safety, as well as reinforcing social status. The behaviour of sittellas on arrival at the roost is highly ritualized, reflecting dominance ranking within the group. The final configuration, and the order of sleeping and waking, conferred protection on the young and the breeding female. Reflecting their lack of parental responsibility, the immature male and the immature female, from 2 to 6 months post-fledging, were always the first two individuals to fall asleep, the female being the first on 28 out of 36 nights. Significantly, the outermost male was the last to go to sleep on all but two of 16 nights, whereas the innermost male was sometimes among the first asleep. The outermost male appears to act as a guard for the group, staying awake for up to 48 minutes after settling. Only the outer end of the roosting huddle afforded an almost unobstructed view of the surroundings, whereas the view of the innermost male was always partly obscured by the branch adjoining the roost branch, as well as by the individual bird roosting alongside. There would seem to be little benefit in the outermost male staying awake for up to 48 minutes after settling unless there was some risk of attack from a predator. The risk of predation also explains the early roosting time of sittellas, the staggered, rather than simultaneous, arrival of individuals at the roost, and the distinctive pre-sleeping posture.

## Voice

Given that most sittellas probably remain with their natal group or clan, and that group-members stay close together throughout



the day, each having a clear dominance rank within the group, there is little need for long-distance calls or a sophisticated vocal repertoire. The vocabulary of sittellas is therefore relatively simple, and the most frequently uttered calls are concerned with co-ordination of group activities.

Of the five vocalizations known for the nominate race of the Varied Sittella, the most commonly heard is the monotonous "chip" contact call, which is repeated frequently during foraging and flying. The rallying call, a drawn-out double whistle of upward-inflected notes, signifies an individual's intention to fly and apparently serves to synchronize the flight of all members of the group, so that there are no stragglers. As other group-members respond with rallying or contact calls, the noise of the group often rises to a crescendo just prior to take-off. During the breeding season, the chattering food-begging calls are given incessantly by the incubating female, as well as by fledglings and dependent juveniles, when receiving or begging for food. These calls resemble a rapidly repeated, high-pitched version of the contact call, and are invariably accompanied by wing-quivering.

When subordinate adults or juveniles approach a dominant or older individual, they often crouch and quiver the wings, and occasionally emit a soft, wheezing "Submission call". This vocalization is given also by the breeding female prior to copulation with her mate. When suddenly startled by a potential aerial predator, sittellas utter an alarm call similar to the food-begging call, but shriller and more sustained. All group-members then freeze in the head-down position, the body oriented parallel to the branch or hanging upside-down under the branch.

The Black Sittella of montane New Guinea appears to have similar vocalizations to those of its more widespread congener. Its incessant contact calls are described as faint, sweet, "sucked-in" notes, which are louder when given in flight than when uttered from a perch. Black Sittellas also give faint chattering calls when two individuals interact.

## Food and Feeding

Sittellas eat a wide variety of insects and other arthropods. Of 992 items found in the stomachs of 59 Varied Sittellas from north-east New South Wales, over a third, 36%, were small adult beetles (Coleoptera), mainly of the families Curculionidae (weevils), Chrysomelidae (leaf beetles), Coccinellidae (ladybugs) and Elateridae (click beetles). Bugs (Hemiptera) and spiders (Araneae)



together comprised roughly a further quarter, respectively 14% and 13% of items. The larvae of beetles, including those of the families Cleridae and Melyridae, and of moths (Lepidoptera), including geometrids, comprised about 33% of the total prey biomass in the stomachs, despite the fact that they constituted only 17% of the total number of items. Other taxa recorded in stomachs of Varied Sittellas from here and elsewhere were grasshoppers (Orthoptera, including Gryllacrididae), craneflies (Tipulidae), cockroaches (Blattodea), wasps and bees (Hymenoptera), termites (Isoptera), lacewings (Neuroptera) and pseudoscorpions (Pseudoscorpiones).

In stark contrast to the other, larger bark-foraging specialists of the region, the Australasian Treecreepers, sittellas consume relatively few ants (Formicidae). Ants constituted a minor proportion, just 7%, of the items found in the stomachs of Varied Sittellas from north-east New South Wales, and were found in only a third of these specimens. Moreover, only one of the faecal samples from ten mist-netted individuals contained ants. In south-west Western Australia, however, faeces from four Varied Sittellas contained mostly beetles and ants, which accounted for, respectively, 81% and 12% of items. Apart from the obvious disparity between these two regions in the relative importance of beetles, prey sizes indicate that the diet of sittellas may vary geographically: at the Western Australian site, 83% of prey items were estimated to be less than 4 mm in length, whereas the mean lengths of the three major taxa constituting 63% of items in New South Wales ranged from 4 mm to 10 mm. As may be expected from the shorter bill, sittellas ate significantly smaller beetles and spiders than did co-occurring Red-browed Treecreepers (*Climacteris erythrops*), although the two species did not differ in the size of larvae and bugs that they took.

The importance of larvae in the diet of sittellas was confirmed by sightings of prey items in the north-east New South Wales studies. Of 70 prey items observed, 87% were larvae. Although beetle grubs were more numerous than were moth caterpillars in stomachs, the latter predominated in direct observations, presumably because of their generally larger size. In tall mulga (*Acacia aneura*) shrublands in central Australia, 16% of 43 observations of feeding sittellas involved caterpillars of geometrid moths taken from mulga foliage, but these larvae were unusually abundant at the study site. Although little is known about the diet of the Black Sittella in the montane rainforest of New Guinea, one individual of this species was observed as it ate a larva 3 cm long, and stomachs of specimens contained caterpillars and a spider.



Possibly the most accurate description of the typical foraging behaviour of sittellas was provided by Diamond and concerned, rather ironically, the rarely seen Black Sittella.

"It hops rapidly along a branch at about 300 mm per second, leaning over and peering first to one side then the other, and flits off to another branch. While it occasionally clings to the underside of a horizontal branch or goes up a vertical one, much more often it remains on the upper side of horizontal branches."

This account applies equally well to the Varied Sittella, which in 7-8 hours of foraging observations in north-east New South Wales spent 41% of the time hopping, mostly in this zigzag fashion, along branches away from the tree trunk, and 17% moving back towards the trunk. As it leans over the side of the branch, it often quickly flashes and gently quivers the wing furthest from the branch, probably to flush cryptic prey by frightening it with the sudden or flickering motion, or the boldly contrasting colour pattern in the wing. After reaching the end of a dead branch, the sittella will often circle the tip to scan any broken parts, and then turn around and hop quickly back towards the trunk, without pausing. On tree trunks, sittellas at the above site spent a similar amount of time descending, head first, as they did ascending, respectively accounting for 19% and 23% of timed observations. Both species of sittella often hang upside-down from branches while probing the bark or moss for insects. Allegedly, New Guinea races of the Varied Sittella frequently crawl on the underside of branches, but such behaviour, as it is very rare or non-existent among Australian populations, may be peculiar to those inhabiting rainforest, where an abundance of lichens, mosses and other epiphytic plants provide ample irregularities to grip while the bird is upside-down.

Varied Sittellas in north-east New South Wales climb at an average speed of 60 mm per second, much slower than the speed reported by Diamond for the Black Sittella. The mean distance flown between branches was 88 cm. In the intensive study in New South Wales, it was found that Varied Sittellas spent, on average, 58 seconds on each tree, although in New Guinea both species purportedly spend a few minutes in each tree before flying off. It seems unlikely, however, that sittellas in New Guinea spend three times longer on a tree and yet climb five times faster than do those in Australia.

Sittellas feed mainly in the canopy, but they do occasionally descend to the lower portions of tree trunks or forage on stumps and logs. Foraging heights depend to some extent on the canopy height. In the eucalypt forests of north-east New South Wales, where the canopy height was around 20 m, some 6-13% of observed foraging attempts were made at heights greater than 15 m, whereas in south-east New South Wales, where the canopy rose to more than 30 m, 36% of foraging heights were above 14 m. In contrast, in low banksia (*Banksia*) woodland in south-west Western Australia, 96% of observed foraging was at 2-6 m, and in mulga shrubland in central Australia the mean foraging height was only 2.4 m.

In studies in eucalypt forests of eastern Australia, Varied Sittellas exhibit a distinct foraging preference for the highly fibrous-barked stringybarks, largely ignoring the many other eucalypt species, which constituted at least half of the trees and were predominantly smooth-barked. In New South Wales, for example, stringybarks accounted for 80% of 776 trees visited in the north-east of the state and for 89% of 357 trees in the south-east. Nevertheless, in wandoo woodlands of Western Australia, where the smooth-barked wandoos *Eucalyptus wandoo* and *Eucalyptus accedens* form almost pure stands, 89% of 114 observed foraging attempts were on these two species, suggesting that the tree-species preferences of sittellas vary geographically, depending on the available bark types and perhaps their arthropod fauna. In the monsoon tropics of northern Australia, too, sittellas appear to be at least as common in woodlands dominated by the predominantly smooth-barked Darwin woollybutt (*Eucalyptus miniata*) or the entirely smooth-barked salmon gum (*Eucalyptus tintinnans*) as they are in open forests dominated by the entirely rough-barked Darwin stringybark (*Eucalyptus tetradonta*). In eastern Australia, Var-

*Sittellas exclusively eat insects and other arthropods. Over a third of the diet of the Varied Sittella comprises beetles. Bugs and spiders together make up a quarter, and the larvae of beetles and moths form a third by weight; cockroaches, wasps and grasshoppers are also taken. The shorter bill of the sittella compared with that of the partially co-occurring Red-browed Treecreeper (Climacteris erythrops) means that it captures significantly smaller spiders and beetles than its fellow bark specialist. Unlike the Australasian treecreepers, sittellas consume few ants.*

[*Daphoenositta chrysoptera pileata*, Australia.  
Photo: Roland Seitre]



Facing downwards on a vertical trunk, this Varied *Sittella* may have just flushed out its prey by flicking open a wing. Sittellas feed mainly in the canopy. Like fellow bark-foragers such as Australasian treecreepers (Climacteridae), sittella sexes differ in preferred foraging heights and substrates. This may relate to sexual dimorphism in bill length and hind-claw curvature. The longer-billed male is better adapted to probing crevices in rough-barked trees, while his more strongly curved hind-claws give him the good grip necessary to descend head first to the lower trunk.

[*Daphoenositta chrysoptera chrysoptera*, Warriewood, Australia. Photo: Nevil Lazarus]



ied Sittellas display a constant predilection for dead branches, although this varies with eucalypt species: on smooth-barked boxes, gums and ashes 42–80% of foraging was on dead branches, whereas on stringybarks the figure was only 25%.

Like many bark-foraging birds, including the forest dwelling White-throated (*Cormobates leucophaea*) and Red-browed Treecreepers sharing their habitat, sittellas exhibit marked sexual differences in foraging behaviour. In north-east New South Wales, male Varied Sittellas of the nominate race spend significantly more time at lower levels and on rough-barked trunks and large boughs than do females, the latter concentrating instead on predominantly smooth-barked branches and twigs, which are most abundant at higher levels. In one colour-ringed group of four adults and two juveniles aged 2–3 months, the mean foraging heights of the two adult males were 10 m and 11 m, whereas those of both adult females were around 14 m; as the breeding male tended to forage at higher levels than those exploited by the non-breeding male, it is possible that he was guarding the breeding female from his potential sexual rival. The two juveniles, one of each sex, foraged at intermediate levels, and, as they did not differ in their foraging heights, it is possible that the sexual differences apparent between adults are learned, rather than being innate. Alternatively, the foraging heights of these juveniles may be optimal in terms of provisioning and protection from predators by adults of both sexes.

Sexual differences in preferred substrates, and hence in vertical heights, may be related also to sexual dimorphism in bill length and hind-claw curvature (see Morphological Aspects). The longer-billed male seems better equipped to probe into the deep fissures on the trunks and boughs of stringybarks, and its more strongly curved hind claws would be advantageous for gripping the surface when descending trunks head first.

Intersexual foraging segregation may alleviate intraspecific competition for food, which could be critical for bark-foragers in search of scarce cryptic prey, but there are no obvious differences between the sexes in the types and size of prey that they select. Instead, foraging segregation of the sexes in the case of the sittellas seems to have evolved in response to their sociality, as all members of the group (see General Habits) invariably forage in one tree simultaneously. Separation of the sexes reduces the chance of hostile interactions between group-members and, further, reduces the probability of an individual wasting its time

by foraging in areas that have already been investigated or exploited by another, thereby increasing its foraging efficiency. The extent of sexual differences in foraging behaviour may be expected to vary regionally, depending on the range of tree heights and bark types available, yet vertical segregation of the sexes occurs also among Varied Sittellas of the race *leucoptera* in the Darwin region of north-west Australia, about 3000 km distant from the above-mentioned nominate population, indicating that the phenomenon may be widespread.

The major foraging techniques of Varied Sittellas are glean-ing at the bark surface, which accounted for 53–99% of observations in nine studies, and probing into crevices or curled strips of peeling bark, which represented 12–47%. In addition, these birds occasionally sally for aerial insects or web-spinning spiders, and they even glean from foliage; indeed, foliage-gleaning made up 16% of foraging in one study. A further common technique, but one as yet unquantified, is that of scaling or flaking, whereby the bird dislodges a flake of bark to expose hidden prey; it achieves this by wedging the lower mandible under the bark, and then pushing the head forwards and upwards, using the tip of the bill as a pivot.

Unlike the Australasian treecreepers, sittellas regularly use their feet in order to hold a prey item on to the branch while preparing it for ingestion, or to anchor curled strips of bark while probing them. As is the case with many species of parrot (Psittaciformes), the left foot is used significantly more than is the right one, evidence of functional asymmetry in the brain; in one study, Varied Sittellas used the left foot 32 times and the right one 16 times. Before swallowing a large caterpillar, the bird whips it several times across the branch while holding it in the bill; it then extracts the viscera while pinning the prey down by the foot, and finally discards the viscera by wiping it across the branch. The hard wing shields (elytra), head and thorax of beetles are torn off in a similar manner.

As a final point of interest, the Varied Sittella has been reported once as using tools, although such behaviour must be either extremely rare or restricted to certain populations. Three individuals of the nominate race allegedly utilized small match-stick-sized strips of wood or twigs in order to extract wood-boring larvae; they poked the strip into holes in branches, and even carried the implement for a short distance before repeating the performance.



## Breeding

Co-operative breeding is possibly obligatory for successful reproduction by the Varied Sittella. Of 23 nests of this species observed in north-east New South Wales, only two were attended by simple pairs, and neither of these succeeded in producing offspring. Breeding groups usually comprise a breeding pair and one to seven helpers, which assist in the construction of the nest, the feeding of the incubating female, the feeding of the young and the removing of their faecal sacs, and the defence of the nest.

Evidence for plural co-operative breeding, in which two or more females within a group engage in reproduction, derives from several sources. As long ago as 1917, P. A. Gilbert had watched four adults as they fed young at one nest, after which they flew off to collect food for young in another nest about 90 m away. In north-east New South Wales, a clan of twelve individuals divided into at least three breeding groups, and, although the breeders in these groups occupied exclusive areas, two colour-ringed non-breeders shared two of these areas and concurrently helped both groups in their breeding attempts. In south-east New South Wales, two nests separated by 500 m were both attended by up to five individuals; as the number of attendants at each varied demonstrably during the day, however, the observer of these nests speculated that only one roving clan might have been involved.

Finally, nest-sharing, in which two females lay eggs and incubate or brood in the same nest, side by side, has been recorded at least twice, indicating a level of tolerance among breeding females that is usually absent in non-plural co-operative breeders. Such instances also suggest the possibility of polygynous matings.

Although observations of colour-ringed Varied Sittellas in north-east New South Wales indicate that social monogamy is the rule, several instances of sexual rivalry among members of one group suggest that there is potential for extra-pair copulations. Immediately before the completion of one nest, the breeding male was seen repeatedly to supplant and chase the other two males in his group whenever they approached the nest and the breeding female, possibly guarding her to avoid being cuckolded. Moreover, in two seasons, just prior to nesting, the breeding female repeatedly attacked non-breeding females as they attempted to join the roost.

That Varied Sittellas are multi-brooded is clear from several reports of late nests at which juveniles 8 weeks old provided help in nest construction or in the feeding of their younger siblings. In north-east New South Wales, the species lays eggs in all months from August to January, with peaks in late September and late November, probably coinciding with first and second clutches. In the tropical north of Australia, however, the breeding season appears to be broken by the first major rains, as clutches have been recorded during the middle to late dry season, from July to October, as well as during the latter half of the wet season, from February to April.

Although neither sittella species in New Guinea has been observed while nesting, Black Sittellas had enlarged gonads in both August and May. This suggests either a biannual breeding season, as in many species in the monsoon tropics of Australia, or year-round breeding, which seems feasible in view of the constantly wet conditions of the species' equatorial montane habitats.

The nest of the Varied Sittella must surely be one of the most exquisitely camouflaged of all bird nests. A deep cup on the inside, it appears cone-shaped or even tube-shaped on the outside, and is usually built at the base of a two-pronged fork of a near-vertical branch, although some nests are built on top of a knot or small kink in a more horizontal branch. The nest is composed largely of small pieces of finely shredded bark, occasionally mixed with fur, plant down or dry lichen, and copiously bound with spider web and egg sacs. Externally, it is decorated with flakes or short strips of bark laid vertically, or with lichen, depending on the colour and texture of the supporting branch, which it invariably closely matches. The top of the nest is left jagged, with small pieces of bark or lichen protruding upwards, giving the appearance of a broken-off limb. Internally, it is lined with soft bark, spider egg sacs, moss or lichen, and occasionally with wool, fur or feathers, the resultant colour pattern at least sometimes camouflaging the blotched eggs.

Of 57 nests of Varied Sittellas found in north-east New South Wales, 95% were built on dead branches, and 88% were in stringybarks, mostly of the species *Eucalyptus macrorhycha*, and always in the upper half. Elsewhere, nesting trees include she-oaks (*Casuarina* or *Allocasuarina*), acacias and paperbarks (*Melaleuca*). The height above ground at which nests are built varies from 6 m to 25 m, with averages of 11 m and 13 m at two localities. In some places, certain nest trees, or even nest branches, are reused over several consecutive seasons, and in at least one reported case a nest-site was reused within the one season, following a successful earlier brood. Although the building of the bulk of the nest requires only 5–9 days, the internal and external lining may take up to ten more days to complete. Materials from recently abandoned nests are used in the construction of new nests. The time taken to construct the nest may depend on the number and skills of the available helpers, which sometimes include juveniles, as young as 7 weeks post-fledging, from a previous brood. At one nest, the percentage contribution in terms of building visits made by the primary male and the primary female was 21% for each; that of the non-breeding male was 25%, and the respective figures for the yearling female and male were 18% and 11%. An individual, if it came to the nest "empty-handed", would often sit inside, adjusting the exterior with the bill and moulding the interior of the nest by means of trembling body movements. Despite the length of time taken in the building work, many nests are abandoned soon after completion, apparently in response to disturbance by a potential predator. In one study, up to 25% of nests were abandoned in this way.

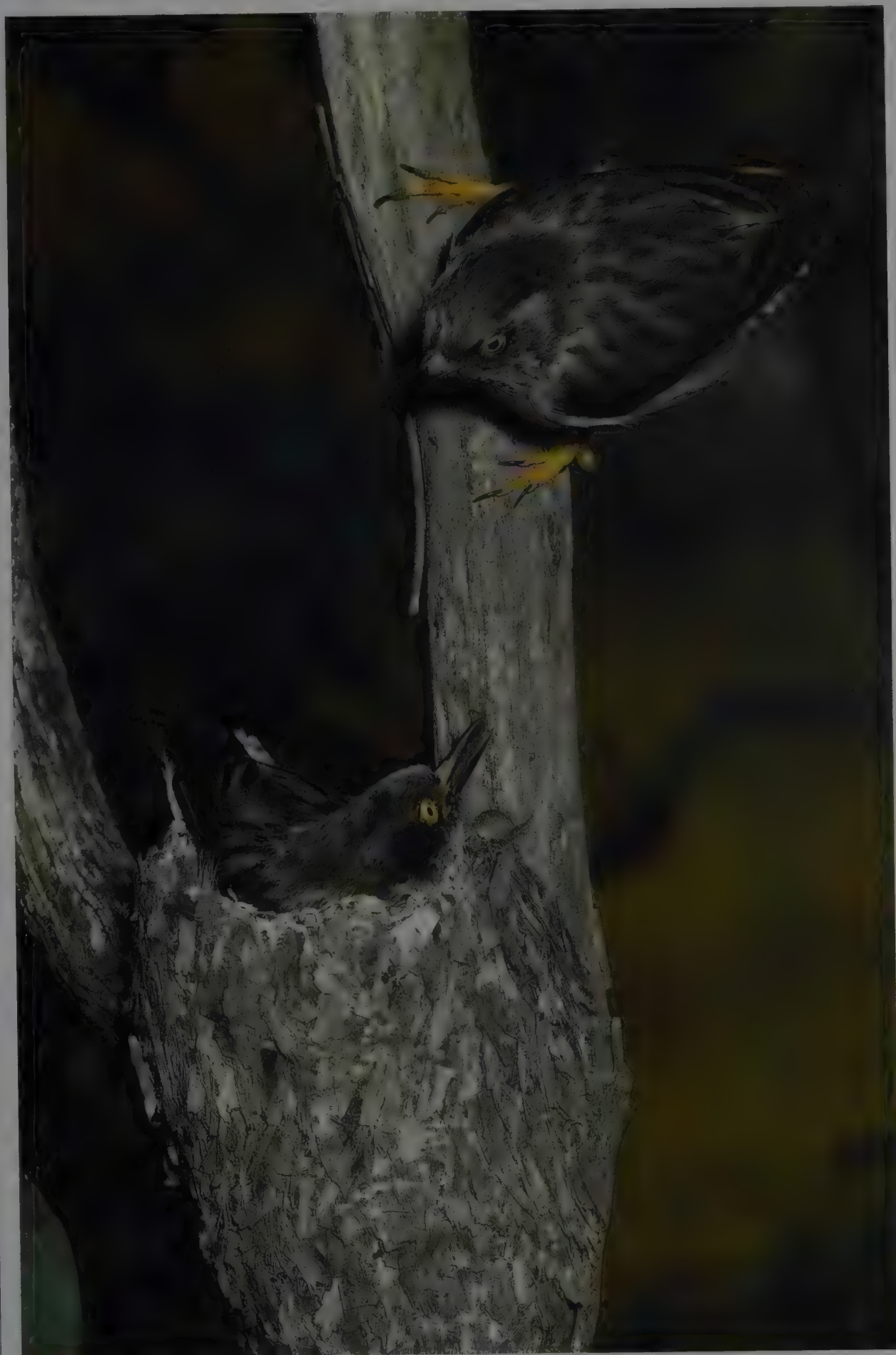
The primary male feeds the primary female prior to, and during, egg-laying, which begins 4–12 days after the nest has been completed; whether the helpers feed her at this stage is not known. Copulation is a simple affair, the female crouching over a branch, with wings quivering, and the male spiralling around her several times, before he mounts her.

The clutch of the Varied Sittella usually comprises three eggs, but clutches of two eggs are also common. All nine accessible nests at one site in north-east New South Wales had three eggs, and 24 of 39 nests in the Birds Australia Nest Record Scheme held three eggs, while twelve of the remaining 15 had two eggs. One reported clutch of five eggs, and another of seven, may have been the result of two females laying in the same nest. The eggs of this species are bluish-white or greenish-white, boldly spotted and blotched with black, grey, lilac, olive and/or sepia, these markings concentrated mostly around the centre or at the larger end, and often forming a defined zone. They are reminiscent of those of certain flyrobins and monarchs of the respective genera *Microeca* and *Myiagra*. As with so many other Australian passerines, the eggs are usually laid at 48-hour intervals, although those in one clutch of two eggs were apparently laid approximately 24 hours apart. Incubation begins with the laying of the second egg, which results in asynchronous hatching and fledging in at least some three-egg clutches. Except in the rare instances when two females share a nest, only the primary, breeding, female is responsible for the incubation of the eggs and the brooding of the chicks.

Given its body size and exposed nest, the Varied Sittella has a surprisingly lengthy incubation period, as long as 19–20 days, this perhaps the consequence of its specialized foraging niche and a relatively scarce food supply. Other Australian bark-foragers are less specialized in their choice of prey and foraging substrates; the Australasian treecreepers, for example, eat a large number of easily procured ants to compensate for the low abundance or patchiness of other bark-dwelling prey. Scarcity of suitable prey also explains the necessity for the primary male and all available helpers to feed the incubating female as often as twice a minute, but more usually 3–10 times per hour. Depending on the time of the day, the female sits for 55–92% of the time, the average at different nests varying from about 60% to 79%, during bouts lasting 7–56 minutes. The averages of incubating bouts at two nests with three eggs were 20 and 22 minutes. Despite receiving most of her food either on the nest or within a metre of it, the female leaves the nest for an average period of 10 minutes, but up to 36 minutes, during which time she begs for food, with constant shrill chattering and with wings quivering, as she scuttles

The **Varied Sittella**, like many Australasian passerines, breeds co-operatively. The bird descending the branch to feed the incubating female may be either the latter's male partner or a helper. In the sittella breeding system, a central breeding pair is assisted by 2-4 non-breeding adult auxiliaries. These helpers assist in the construction of the nest, the feeding of the incubating female and young, the removal of faecal sacs and the defence of the nest. Helpers at a second brood in the breeding season may include two-month old juveniles from the first brood. The female incubates on an extremely well-camouflaged nest. On the inside it is a deep cup, but the outside is cone-shaped. Usually placed at the base of a two-pronged fork, as here, the nest is constructed from small pieces of bark, sometimes mixed with fur, plant down or lichen, and bound with spider web. Outside, it is decorated with short, vertical strips of bark or with lichen to match the colour and texture of the nest tree. The top of the nest has protruding bits of bark or lichen to make it look like a broken-off tree limb. The bulk of the nest takes only 5-9 days to build, but the decoration and lining can take a further 10 days, depending on the number of helpers. Most nests are built relatively high in the respective tree, and nest trees may be reused in consecutive breeding seasons.

[*Daphoenositta chrysoptera chrysoptera*, Canberra, Australia. Photo: Graeme Chapman]







At 18–20 days, the nestling period of the Varied Sittella is as prolonged as its surprisingly lengthy incubation period. All members of the group feed the nestlings; here we see a female feeder on the left and a male on the right. At 17 days old, the chicks take their first tentative steps outside the nest, then rapidly return to safety, but within three days they are actively flying around with the group. This does not, however, mark the end of the parents' responsibilities. Juvenile sittellas remain dependent on their parents for at least 60 days after fledging. This unusually protracted period may be related to the species' specialized niche and the time required for juveniles to learn sex-specific foraging behaviour.

[*Daphoenositta chrysoptera pileata*, Rupanyup, Victoria, Australia.  
Photos: Hans & Judy Beste/Lochman Transparencies]

along branches close to the nest. Yet she also sometimes gives rallying calls (see Voice) while sitting on the nest, presumably signalling her intention to leave and her demand for food. One female was observed to call continuously for 25 minutes during an incubation session of 35 minutes.

Nestlings of the nominate race of the Varied Sittella are well covered in pale grey down, which is retained for at least eight days, at which time the eyes begin to open and the wing quills begin to erupt. The bill is blackish, the rictal flange, or gape, is pale cream, and the legs are flesh-brown. As with the incubation period, the nestling period is long, lasting for 18–20 days. The female broods the chicks for 60–75% of the time during their first day after hatching, but this decreases over the following eight days, until she stops daytime brooding after a period of 9–14 days. At night, however, she broods for up to 16 days after the hatch. All members of the group, except perhaps unrelated females, feed the young and remove their faecal sacs. During the first week, at least, the primary male and helpers often deliver their offering to the brooding female, which passes it to the nestlings or, in some cases, eats it herself; in one study, the female consumed 24% of such food deliveries. At one nest with three chicks, the contribution by the primary pair was 58%, of which 35% was by the male, while the remaining three group-members, consisting of a non-breeding adult male and a juvenile of each sex, each contributed 10–18% of the total feeds. The mean provisioning rates vary from 12 to 20 feeds per hour, although at one nest with at least five attendants 46 feeds were observed in 63 minutes of observation. In their apparent enthusiasm to feed the chicks, the provisioners often queue beside the nest, making both themselves and the nest-site conspicuous through their jerky movements and constant chatter. When a potential predator approaches the nest, all group-members join in trying to distract it, by quivering or waving their wings as they hop about.

From the 17th day after hatching, chicks may climb out of the nest and hop along adjacent branches before returning to the nest. At two nests each containing three chicks, two of the young left on the 18th day but the third remained in the nest for a further 24–48 hours, suggesting asynchronous hatching. On their first night out

of the nest, the fledglings sometimes roost separately from their carers, but otherwise they join the group roosting huddle (see General Habits). For the first one or two days they remain close to the nest tree, spending long periods stationary within the canopy, but by the third day they are actively climbing over branches, and flying with the rest of the group, as far as 300 m from the nest.

Parental care by the Varied Sittella is prolonged. Juveniles are fed for at least 60 days, and occasionally up to 80 days, after fledging. This unusually protracted period of care may reflect the time required for the young to perfect the techniques of locating, capturing and dealing with prey. cursory observations indicate that the adults mainly provision juveniles of the same sex as their own, providing a possible mechanism for the young to learn their sex-specific foraging niche. On the other hand, such brood division could be expected by chance if the sexual differences in foraging behaviour of this species are innate and reinforced by dimorphism in bill length.

Breeding success of Varied Sittellas was low in north-east New South Wales, where only ten of 49 nests produced fledglings. Although up to twelve of these nests may have been abandoned before laying commenced, at least six were preyed on. Several groups made four unsuccessful nesting attempts in a single season. For 91 nests recorded in the Birds Australia Nest Record Scheme, success was much higher, at about 62%, but such reports, scattered over the continent, are probably biased in favour of nests that survive the critical early stages.

While the majority of small songbirds in Australia, and even those building well-protected domed nests, are subject to brood parasitism by one or more species of cuckoo, there are comparatively few records of Varied Sittellas being parasitized. Nevertheless, five species of cuckoo have been reported as laying occasionally in the nests of this species; these are the Brush (*Cacomantis variolosus*), Fan-tailed (*Cacomantis flabelliformis*) and Pallid Cuckoos (*Cuculus pallidus*) and Horsfield's (*Chrysococcyx basalis*) and Shining Bronze-cuckoos (*Chrysococcyx lucidus*). It is possible that the apparently low rate of brood parasitism is the result of negative selection pressure, owing to high

To make the most of its superbly-camouflaged nest and to reduce the risks of its lengthy nestling period, the *Varied Sittella* must take care with nest hygiene and concealment. As a result, parents and helpers assiduously remove the nestlings droppings in the form of faecal sacs, and deposit them well clear of the nest-site, so as to avoid drawing potential predators towards the nest. This dramatic photograph also shows to good effect the striking wingbar, formed by a chestnut band on the primaries and secondaries. Its colour and extent vary between subspecies.

[*Daphoenositta chrysoptera chrysoptera*.  
Photo: W. R. Taylor/Ardea]



rates of nest abandonment or failure in at least some sittella populations.

Few data on longevity are available. At one locality near Sydney, 19 Varied Sittellas were ringed over a period of 20 years, and five were recaptured, all of these within 19 months of initial capture. At another locality, one male was recaptured almost seven years after it had been ringed at the same site.

As intimated earlier, the breeding habits of sittellas in New Guinea are not known. Indeed, virtually nothing has yet been discovered about the behaviour and general ecology of the Black Sittella, a species restricted to the island's mountains.

### Movements

Because they fly at a high level, sittellas are rarely caught in mist-nets. Consequently, there are insufficient data to estimate survival rates or dispersal distances. Up to the year 2001, only 506 Varied Sittellas had been ringed in Australia and New Guinea, and only 32 of these, a mere 6%, had been recaptured, all close to the site of ringing. One was caught at the site at which it had been ringed almost seven years earlier. Observations of colour-ringed individuals in north-east New South Wales suggest that males stay within their natal territory, but that at least some females disperse in their first year, prior to the next breeding season.

### Relationship with Man

No relevant information.

### Status and Conservation

Neither member of the family is considered to be globally threatened. The Varied Sittella has a large range, and its global popula-

tion, although not quantified, is believed to be fairly substantial. This species is common in at least parts of its range, both in Australia and in New Guinea. The Black Sittella is poorly known but seems generally uncommon to rather rare, although it is locally common on Mount Tafa, in south-east New Guinea. Its global population has not been quantified, but it is believed not to be sufficiently low to give cause for concern.

In the period between the two Australian national bird atlases, surveys for the first of which took place during 1977–1981 and that for the second in 1998–2002, reporting rates for the Varied Sittella decreased in some regions but increased in others, and there was no significant change in overall status. As may be expected, the Varied Sittella has declined in many parts of its Australian range where habitat clearance has taken place. In the fragmented landscape of the Australian Capital Territory, in the south-east of the country, the presence of the species was found to be related to the size of woodland remnants and the complexity of the habitat. This species occurs at estimated densities varying from 0.1 to 0.6 individuals per hectare.

There seems to be little threat to either the Varied Sittella or the Black Sittella in New Guinea. Here, both species are confined to mountains, which are generally inaccessible to loggers.

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## PLATE 50

## Family NEOSITTIDAE (SITTELLAS) SPECIES ACCOUNTS

### Genus *DAPHOENOSITTA* De Vis, 1897

#### 1. Varied Sittella

##### *Daphoenositta chrysoptera*

**French:** Néositte variée **German:** Spiegelkleiber **Spanish:** Neosita Variable  
**Other common names:** Black-capped Sittella (*pileata*); Orange-winged Sittella (*chrysoptera*); Striated Sittella (*striata*); White-headed Sittella (*leucocephala*); White-winged Sittella (*leucoptera*); Papuan/Mountain Sittella (New Guinea races); Pied Sittella ("albata")

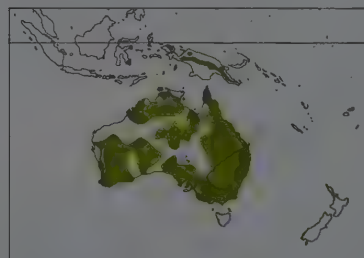
**Taxonomy.** *Sitta chrysoptera* Latham, 1801, Sydney, New South Wales, Australia.

Formerly placed in a separate genus, *Neositta*. Australian races in past treated as five separate species, but each hybridizes and backcrosses with adjacent races; New Guinea races have been treated together as representing a further, distinct species (*D. papuensis*). Described form *albata*, known only from 19th-century specimens from NE Australia (E Queensland), considered an intergrade; other proposed races from Queensland include *rothschildi* (NE area, S to Cairns) and *magnirostris* (Inkerman area), both synonymized with nominate, as also is *lathamii* (from E Victoria); *lumholtzi* (Rockhampton area of E Queensland) is treated as a synonym of *leucocephala*. Eleven subspecies recognized.

##### **Subspecies and Distribution.**

- D. c. papuensis* (Schlegel, 1871) – mountains of Vogelkop Peninsula, in W New Guinea.
- D. c. alba* (Rand, 1940) – Foya Mts, N of R Idenburg, in N New Guinea.
- D. c. intermedia* (Junge, 1952) – W end of Snow Mts (Wissel Lakes area), in WC New Guinea.
- D. c. toxopeusi* (Rand, 1940) – Snow Mts, in WC New Guinea.
- D. c. wahgiensis* (Gyldenstolpe, 1955) – Central Highlands (Mt Hagen–Wahgi Valley), in EC New Guinea.
- D. c. albifrons* (E. P. Ramsay, 1883) – mountains of SE New Guinea.
- D. c. leucoptera* (Gould, 1840) – CN Australia from NE Western Australia (Kimberley region) E to SE head of Gulf of Carpentaria, S to Great Sandy Desert (in W) and about Tropic of Capricorn (in E).
- D. c. pileata* (Gould, 1838) – C & S Western Australia (N to S Great Sandy Desert) E through S Northern Territory and South Australia to far SW Queensland, W New South Wales and NW Victoria.
- D. c. striata* (Gould, 1869) – NE Australia from Cape York S to R Burdekin, in NC Queensland.
- D. c. leucocephala* (Gould, 1838) – CE Australia from R Burdekin S to Queensland–New South Wales border, and inland to Great Dividing Range.

*D. c. chrysoptera* (Latham, 1801) – SE Australia from SC Queensland S through E New South Wales and E Victoria.



**Descriptive notes.** 10–14 cm, mostly 10.5–11.5 cm; 8–20 g (Australian races 10–17 g). Short-tailed passerine with highly variable plumage. Male nominate race has forehead and short diffuse supercilium pale grey, crown to nape, lores and ear-coverts grey-brown (sometimes lores and ear-coverts darker, forming mask), hindneck and neck side greyer with darker shaft streaks; upperparts grey or grey-brown, streaked with dark brown or dusky, uppertail-coverts white to light buffish; tail black with prominent white tip; upperwing black, prominent broad orange-rufous band across primaries and secondaries (mostly concealed when wing folded); chin, throat and malar region whitish to light grey, malar area often with some indistinct dark mottling; underparts white, breast side streaked finely dark brown, undertail-coverts whitish with broken black bars; iris and prominent eyering orange-yellow; bill slightly upcurved, brownish-black with yellowish or orange-brown base; legs orange-yellow. Female is very like male, and sometimes indistinguishable, but often has darker face mask, usually heavier markings on throat and malar region. Juvenile differs from adults in having upperparts brown, boldly streaked white, underparts plain white, eyebrow and ear-coverts white, dark eyestripe (indistinct on lores), orange-buff tips of greater and median secondary wing-coverts, narrow orange-buff tips of greater primary coverts and remiges; iris dark brown, eyering grey, bill black with cream or pinkish swollen gape-flange, legs flesh-brown or grey. Races differ slightly in size, more so in colour of head and wingband, amount of dark streaking on body, and degree of sexual dimorphism in head plumage, in New Guinea also in colours of upperparts and underparts and lack of wingband: in Australia, *striata* is smaller than nominate, with bill straighter and yellow with black tip, cap black, mask dusky-streaked, upperparts with streaking coarser, wingband white and restricted to primaries, underparts more boldly streaked, female has whole of head and neck black; *leucoptera* is similar in size to nominate, has cap black, lower forehead and eyebrow white, otherwise as previous but wingband slightly larger, underparts unstreaked, female with cap more extensive than male's, reaching below eye and onto chin, and lacking white eyebrow; *pileata* is largest race, plumage similar to previous, but upperparts slightly browner and with little or no dark streaking, wingband rufous and extending to secondaries (as nominate), bill slightly upcurved and black-



ish with basal third yellowish, female with larger black cap; *leucocephala* is distinctive, head, neck and throat all white (sometimes pale greyish or with narrow grey streaks), well demarcated from streaked breast, rest of plumage much as nominate but streaking above and below somewhat broader and more diffuse, sexes alike; *alba* also has head all white, but upperparts fawn to dark brown, heavily streaked black, wingband concealed on folded wing, underparts tinged buff or smoky brown and streaked dusky; *papuensis* has black cap with black and white streaking below it, female has head and neck grey with dark streaks; *intermedia* male is intermediate between previous two races; *albifrons* has head entirely streaked black and white, underparts heavily streaked, female head all whitish; *toxopeusi* is similar to last but with less black on cap; *wahgiensis* intermediate between previous two races; females of New Guinea races have head and neck white or grey, with or without dark streaks. **VOICE.** While foraging, a single "chip" repeated monotonously, sometimes accelerating to chatter; prior to flight, drawn-out double "see-wee", each note with rising inflexion; soft wheezing note during appeasement or prior to copulation; incubating female, also fledglings and juveniles, give incessant shrill chatter or twitter when food-begging.

**Habitat.** In Australia, occurs in wide variety of dry eucalypt (*Eucalyptus*) forests and woodlands, with shrubby understorey or grassy ground cover, or both; also in tall shrublands dominated by acacias (*Acacia*) such as mulga or western myall (*Acacia papyrocarpa*) in arid regions, as well as woodlands dominated by casuarinas, such as desert oak (*Casuarina decasneana*) or belah (*C. pauper*), or paperbarks (*Melaleuca*). Scarce in wet eucalypt forest (typically with ferny understorey), and avoids rainforests of all kinds. In stark contrast, New Guinea races are confined to montane rainforest and edges at 1400–2200 m, occasionally down to 1075 m and up to 2600 m.

**Food and Feeding.** Insects and other arthropods. Of 992 items in 59 stomachs from NE New South Wales, over a third (36%) were small adult beetles (Coleoptera), mainly of families Curculionidae, Chrysomelidae, Coccinellidae and Elateridae; bugs (Hemiptera) and spiders (Araneae) comprised roughly another quarter (14% and 13% of items, respectively); larvae of beetles (including families Cleridae and Melyridae) and moths (Lepidoptera, including Geometridae) comprised 17% of all items in stomachs, but c. 33% of total biomass; only a third of stomachs sampled contained ants (Formicidae), which represented only 7% of all items. Of 70 prey items recorded during direct observations, 87% were larvae, mostly lepidopteran caterpillars. Other taxa recorded in stomachs from elsewhere include grasshoppers (Orthoptera, including Gryllacrididae), craneflies (Tipulidae), cockroaches (Blattodea), wasps and bees (Hymenoptera), termites (Isoptera), lacewings (Neuroptera) and pseudoscorpions (Pseudoscorpiones). Of 43 foraging observations in mulga in C Australia, 16% involved caterpillars taken from foliage. In SW Western Australia, faeces from four birds comprised mostly beetles (81%) and ants (12%). Forages at all levels, mainly in canopy; e.g. in eucalypt forests in NE New South Wales c. 70% of observed foraging was at heights of 6–15 m and in SE New South Wales 86% at 6–14 m; but in low *Banksia* woodland in SW Western Australia 96% at 2–6 m, and in mulga in C Australia mean foraging height 2.4 m. Climbs rapidly along upperside of branches, usually in zigzag fashion (leaning and peering down one side and then other), away from and towards trunk, as well as up and down tree trunks. In E Australia, forages mainly on bark of rough-barked eucalypts, particularly stringybarks, which were exploited 80% of time in NE New South Wales and in 89% of observations in SE New South Wales; in Western Australia 84% of observations on smooth-barked wandoo (*Eucalyptus wandoo*), and in C Australia entirely on *Acacia aneura*; in monsoon tropics, observed in woodland dominated by partly rough-barked Darwin woollybutt (*Eucalyptus miniata*) or entirely smooth-barked salmon gum (*Eucalyptus tintinnans*), as well as paperbarks. Substrates used differ with type of eucalypt; on stringybarks in E Australia forages mainly on rough bark of trunks and branches (47–97% at four study sites), whereas on smooth-barked gums and boxes dead branches preferred (42–80%). Sexes differ significantly in foraging substrates and heights in NE New South Wales and in Northern Territory (Darwin region), and possibly over entire Australian range; males spend more time than females at lower levels and on rough-barked trunks and boughs, whereas females concentrate on smooth-barked upper branches and twigs. At one site in NE New South Wales where group colour-ringed, juvenile females foraged significantly lower than did adult females, but juvenile males did not differ from adult males, suggesting that intrasexual competition stronger in females or that intrasexual competition reduced while juveniles are dependent. Main techniques are gleaming or scaling bark surface (53–99% in nine studies) and probing in crevices or curled strips of peeling bark (12–47%), with occasional sallies for aerial insects or web-spinning spiders (3–4%); during scaling, exposes prey by wedging lower mandible under flake of loose bark, then dislodging flake by pushing head forwards and upwards, using tip of bill as a pivot. Regularly uses feet (usually left foot) to hold prey on to branch while preparing it for ingestion, or to secure curled strips of bark while probing them. Before ingestion, large caterpillars held in bill, whipped across branch, then pinned down by foot and the viscera extracted and discarded by bill; elytra and head of beetles torn off. Tool use reported once: three individuals using small twig to probe repeatedly in holes made by wood-boring larvae.

**Breeding.** Season (successful) throughout range Jul–Apr, peak usually Aug/Sept–Dec/Jan; often second clutch laid after successful fledging of first brood. Breeds as pair or, more typically, as co-operative group consisting of primary pair and up to seven (usually 2–4) helpers, including juveniles from previous broods as young as 2 months. Socially monogamous, but mate-guarding suggests potential for extra-pair copulations; several instances of two females laying in one nest; large, weakly defended territory (13–20 ha) or home range. Nest built by primary pair and any helpers present, taking 3–9 days to complete structure, although lining may be added for further 10 days; a neat, deep cup c. 7–8 cm deep externally, tapering at bottom (external diameter c. 5 cm at top, 2.5 cm at base), composed of bark and spider egg sacs, occasionally with addition of fur, plant down or lichen, decorated on outside with flakes or strings of bark, and bound together with spider web. Lined with spider egg sacs, soft bark, moss or lichen, and sometimes wool, fur or feathers; placed in upright fork (colour and texture of nest closely matching those of supporting branch) typically in dead branches of eucalypt (of 57 nests at site in NE New South Wales, 88% in stringybarks, 95% in dead branches), sometimes in casuarina (*Casuarina*), acacia or paperbark, usually in top half of tree at height of 2.5–40 m (average of 230 nests 9.3 m), at two localities in NE New South Wales respective averages 11.3 m and 13.1 m; sometimes builds nest in same tree, even same fork, over several successive seasons, occasionally within same season (for second brood). Clutch 1–5 eggs, mode 3, mean of 39 clutches 2.6, laid on alternate days, probably at intervals of c. 48 hours; incubation (from second egg in some 3-egg clutches, third egg then hatching asynchronously) by primary female (at one nest with two clutches, the two females incubated alongside each other), fed on or near nest by primary male and any helpers present, incubation period 19–20 days; chicks brooded by primary female for 9–14 days, diurnal attentiveness decreasing from 60% of time at

first to 35% by day 8 at one nest, nocturnal attendance ceasing after 15–16 days; primary male and helpers feed young directly or pass food to brooding female, latter then passing it to young or sometimes (24% in one study) eating it herself, mean of 12–20 feeds per hour but reputedly 44 feeds in one hour of observation; nestling period 18–20 days, but if hatching asynchronous youngest chick may leave nest 48 hours after others; juveniles largely independent by c. 2 months, but occasionally fed for up to 80 days after fledging. At two sites in NE New South Wales, respectively 12.5% of 24 nests and 28% of 25 nests produced fledglings; success of 91 nests at other sites combined was higher, at 61.5%.

**Movements.** Resident; all recoveries of ringed individuals were less than 10 km from site where ringed.

**Status and Conservation.** Not globally threatened. Locally common, in both Australia and New Guinea. Estimated densities in Australia 0.1–0.6 birds/ha. Although reporting rates decreased in some bioregions between the two Australian national bird atlases (1977–1981 and 1998–2002), they increased in others, and there was no significant change in overall status. Has declined in many parts of range where habitat clearance has taken place. Within 72 woodland remnants ranging in size from 1.1 ha to 1617 ha, in the fragmented landscape of N Australian Capital Territory, this species' presence was significantly affected by remnant size and habitat complexity. Not at any apparent risk in New Guinea, where confined to relatively inaccessible areas in mountains.

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## 2. Black Sittella

### *Daphoenositta miranda*

**French:** Néosite noire **German:** Prachtkleiber **Spanish:** Neosita Negra  
**Other common names:** Pink-faced Sittella/Nuthatch, Wonder/Mountain Tree-runner

**Taxonomy.** *Daphoenositta miranda* De Vis, 1897, Mount Scratchley, south-east New Guinea.

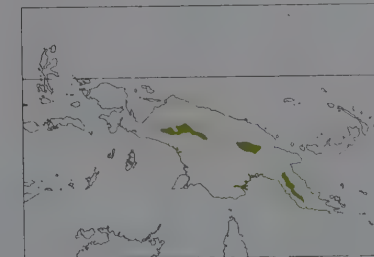
Three subspecies recognized.

**Subspecies and Distribution.**

*D. m. frontalis* van Oort, 1910 – Snow Mts, in WC New Guinea.

*D. m. kuboriensis* Mayr & Gilliard, 1952 – Central Highlands (Kuhor Range and Mt Giluwe), in EC New Guinea.

*D. m. miranda* De Vis, 1897 – mountains of SE New Guinea (Mt Tafa, Mt Scratchley and Mt Albert Edward).



**Descriptive notes.** 12 cm; 12–17.8 g. Male nominate race has forehead, lores and chin bright pink to red; rest of head blackish, body and underwing generally greyish-black with greyish feather edges (giving obscurely scaled pattern), uppertail-coverts slightly vinaceous; tail blackish, all feathers except central two pairs tipped pinkish-white, this colour broadening to terminal half on outermost feathers; underwing with white inner webs near middle of inner primaries and secondaries (apparent in flight as broad white central bar or flash on flight-feathers), and small white patch on greater under primary coverts; iris dark brown;

bill black; legs dark olive-brown. Female differs from male only in bare-part colours, having iris and legs yellow, not dark brown. Juvenile is duller and greyer than adult, with forehead, chin and upper throat cinnamon or rusty brown, cinnamon-brown tips of body feathers, wing-coverts and tertiaries, male iris greyish-brown, female iris pale yellow. Races differ mainly in extent of pink on head: *kuboriensis* has pink more extensive than nominate, reaching to upper throat; *frontalis* has pink extending to lower throat. **VOICE.** During foraging, several group-members continually utter contact call, described as short, faint, sweet, sucked-in, slightly squeaky "sweek, sweek, sweek", louder in flight than when perched; also utters faint chatter during interactions.

**Habitat.** Upper montane (moss) forest, including partly cleared areas; mainly at 2450–3700 m, descending to 2000 m in SE.

**Food and Feeding.** Largely insectivorous; food includes larvae (to at least 3 cm in length), and spiders (Araneae). Forages mainly on high outer branches (live and dead) in canopy, sometimes on lower branches and trunks; in forest gaps may descend to fallen logs. Hops rapidly along upperside of branches, often in zigzag fashion (leaning and peering down one side, then the other); occasionally clings to underside of horizontal branches, and moves up and around trunks. One observed while digging and pounding repeatedly in bark; another watched when shaking and eating a 3-cm grub.

**Breeding.** Males of nominate race (from Mt Tafa) had enlarged testes in both May and Aug, females had slightly enlarged ovaries in Aug, and one juvenile female found in late Aug; these records indicate breeding during dry season, rather than (as reportedly typical for birds in region) during wet season starting in Oct. Invariably encountered in groups of 3–10 individuals, in one case comprising adults with enlarged gonads, adults with no gonad enlargement, and juveniles (with incomplete skull ossification), strongly suggesting co-operative breeding. No other information.

**Movements.** No information.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Papuan Mountains IBA. Little information; generally uncommon to rather rare, but locally common on Mt Tafa. Little evident threat, as the species is confined to mountain areas generally inaccessible to loggers and not subject to any other extensive disturbance.

**Bibliography.** Beehler *et al.* (1986), Coates (1990), De Vis (1897), Diamond (1972), Gilliard & LeCroy (1968), Iredale (1956), Mayr & Gilliard (1952), van Oort (1910b), Parker (1982a), Rand (1936b), Rand & Gilliard (1967), Sims (1956).



Class AVES  
Order PASSERIFORMES  
Suborder OSCINES  
**Family CLIMACTERIDAE**  
**(AUSTRALASIAN TREECREEPERS)**



- Small, rather stout passerines with medium-length slightly decurved bill, moderately long tail, and relatively short, robust legs with long toes and claws; plumage mostly brown or grey-brown, some more rufous, with paler underparts variably streaked, females often with some reddish colour on head or breast.
- 14–19 cm.



- Australia and New Guinea.
- Forest and woodland, one species in montane rainforest.
- 2 genera, 7 species, 18 taxa.
- No species threatened; none extinct since 1600.

### Systematics

It is not surprising that, until the 1960s, the Australasian treecreepers (Climacteridae) were considered to be members of the widespread family of Holarctic, northern, treecreepers, Certhiidae. Their habit of climbing tree trunks, often in a spiral fashion, in search of bark-dwelling insects and then flying down to the base of the next tree is, indeed, reminiscent of that family, as also are their general morphology and coloration. As is more often than not the case with Australasian passerines, however, appearances are deceptive, for closer analysis of the anatomy and behaviour of these two families reveal striking differences between them, reflecting a vastly disparate phylogenetic history. Moreover, recent biochemical evidence suggests that Australasian treecreepers are among the most ancient of living oscines. The similarities between the Australasian treecreepers and the Holarctic treecreepers thus represent a potent demonstration of evolutionary convergence, the result of two entirely unrelated lineages adapting to the bark-foraging niche.

While recognition of the Australasian treecreepers as a distinct endemic avian family came as early as the 1960s, an understanding of their relationship to other families was not achieved until much later. E. Mayr likened the wing and tail patterns of climacterids to those of the Australasian warblers known as thornbills (Acanthizidae), admitting that such resemblances were superficial. Other authorities favoured an affinity with the honeyeaters (Meliphagidae), on the basis of similarities in morphology, including strong feet and a brush-tipped tongue, plumage features and egg coloration, as well as the bark-foraging behaviour of some honeyeaters. These authors also shared the view that the Australasian treecreepers were less well adapted to climbing than are their Northern Hemisphere counterparts, concluding that their "relatively clumsy" climbing behaviour had evolved recently. This view was firmly contradicted by the anatomical evidence assembled by R. I. Orenstein, who instead proposed links with the birds-of-paradise (Paradisaeidae), bowerbirds (Ptilonorhynchidae) and New Zealand wattlebirds (Callaeatidae) on the grounds of the shared presence of the *M. iliofemoralis* externus muscle in the leg.

Thus, the relatives of the Climacteridae remained a mystery until the early 1980s, when molecular techniques revolutionized scientific thinking about the interrelationships of Australian song-

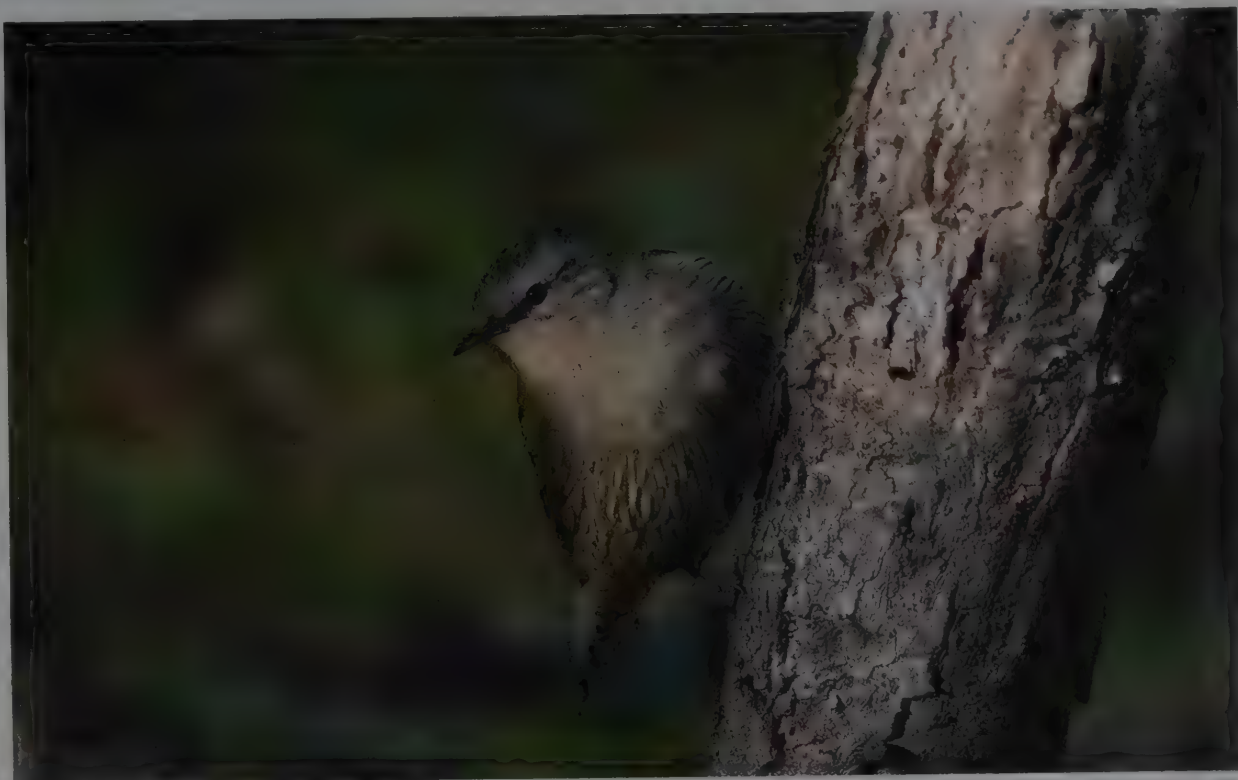
birds, and provided the first hints of their antiquity. On the basis of their studies of DNA–DNA hybridization, C. G. Sibley and J. E. Ahlquist suggested that climacterids were related to the lyrebirds (Menuridae), the scrub-birds (Atrichornithidae) and the bowerbirds, and that the divergence between the Australasian treecreepers and the lyrebirds occurred as long ago as about 48–45 million years. This news was astounding, given the lack of any obvious morphological similarity between treecreepers and lyrebirds, and at best a superficial one with the latter's closest living relatives, the scrub-birds. Nevertheless, the putative relationship of climacterids with the lyrebirds was subsequently corroborated by a study of cytochrome *b* gene sequences, and the link with bowerbirds has recently received support. A detailed study of the syrinx of Australasian treecreepers, however, revealed that its musculature is unlike that found in any other oscine family, suggesting a long separation of the group from the main stem of songbird evolution.

In short, the phylogenetic position of Climacteridae currently remains unresolved, although there can be little doubt that the Australasian treecreepers are among the most ancient of oscine lineages.

Despite earlier attempts to divide the Australasian treecreepers into three genera, the 1926 Checklist of the Royal Australasian Ornithologists' Union (RAOU) recognized only one genus, *Climacteris*, containing nine species. Three of these taxa were reduced to subspecies in A. Keast's 1957 review, although the view that the form *melanotus*, the "Black Treecreeper", was separate from the Brown Treecreeper (*Climacteris picumnus*) persisted until specimens intermediate in colour and size were collected, in 1970. Similarly, the far north-east Australian subspecies *minor* of the White-throated Treecreeper (*Cormobates leucophaea*) was treated as a distinct species, the "Little Treecreeper", separate from the more southerly races, in the *Interim List of Australian Songbirds* and the *Atlas of Australian Birds*, both published by the RAOU, in 1975 and 1980, respectively. This matter was settled when, in 1980, an isolated intermediate form was discovered in the region linking the two forms. This discovery forced a reassessment of the taxonomic status of the Papuan Treecreeper (*Cormobates placens*), which had been treated by Keast and other Australian reviewers as a subspecies of the White-throated Treecreeper. The current consensus is that the Papuan Treecreeper is more dissimilar in plumage and calls

Seven species in two genera make up the Climacteridae, or Australasian treecreepers. The larger of the genera, *Climacteris*, contains five species, including the **Brown Treecreeper**. Initially, climacterids were considered members of the superficially similar and widespread northern treecreeper family, *Certhiidae*. However, the two families have some striking morphological differences, and a vastly disparate phylogenetic history, providing a potent demonstration of evolutionary convergence.

[*Climacteris picumnus victoriae*,  
Chiltern, Victoria,  
Australia.  
Photo: Peter Fuller]



to its Australian counterparts than the Australian forms are to each other, bringing the species count of the family to seven. The subspecies *wellsi* of the Black-tailed Treecreeper (*Climacteris melanurus*), previously treated as a full species, is the other of Keast's three demoted forms.

On the basis of patterns of sexual dimorphism, Keast recognized three "species groups", or superspecies, of treecreepers. These are the "*picumnus* group", comprising the Brown, Rufous (*Climacteris rufus*) and Black-tailed Treecreepers, the "*erythrope* group", consisting of the Red-browed (*Climacteris erythrope*) and White-browed Treecreepers (*Climacteris affinis*), and the "*leucophaea* group", containing the White-throated and Papuan Treecreepers. He noted, however, that the last of these groups was distinctive in its sexual dimorphism, as well as in its juvenile plumage and its egg coloration. Indeed, the difference in egg coloration was so striking as to convince A. G. Campbell, in 1913, that the "*leucophaea* group" warranted generic separation. Even so, it was not until the late 1970s that proper comparisons between the three species groups were possible, following detailed ecological and anatomical studies in the field and the laboratory. These studies revealed that the White-throated Treecreeper was profoundly divergent from members of the other two species groups, culminating in its separation, together with the Papuan Treecreeper, from all other species of *Climacteris*, in the resurrected genus *Cormobates*. This treatment was supported by Sibley and co-workers' analyses of DNA-DNA hybridization, which suggested a divergence time between the two genera of about 24 million years. This divergence led to speculation that *Cormobates* and *Climacteris* might not even be each other's closest living relatives, although there is no evidence as yet to suggest that they have different ancestors.

In appearance, the genus *Cormobates*, comprising the White-throated and Papuan Treecreepers of, respectively, eastern Australia and New Guinea, differs from the other species groups of Australasian treecreepers in having females with a rusty-orange cheek spot, as opposed to reddish-chestnut streaks on the upper breast, and juveniles with white shaft streaks on the scapulars and, in the case of young females, a cinnamon-chestnut rump. The bill of the White-throated Treecreeper is finer than that of *Climacteris* species, and it has a pale base on the lower mandible and a terminal notch on the upper mandible, both lacking in *Climacteris*. Its legs are shorter and its toes longer than those of the latter genus, and the undersurface of the hind toe has unique

scaly ridges. The skull and humerus of *Cormobates* also differ in several respects from those of most *Climacteris* species, and *Cormobates* has nine secondaries, excluding the tertials, whereas *Climacteris* has only six.

The distribution patterns and habitats of these two genera indicate quite disparate evolutionary histories, which are reflected in the myriad differences between them in behaviour and breeding biology. The relictual distribution and upland-rainforest confines of the Papuan Treecreeper and northern races of the White-throated Treecreeper suggest that the genus *Cormobates* evolved in rainforests, and only relatively recently expanded into the woodland habitats typical of *Climacteris* species. In the dark interior of the cloud-enshrouded montane rainforest, concealed inside a tree hole, the eggs of *Cormobates*, white with sparse markings, are possibly less susceptible to predation by visually oriented nest predators than are the profusely spotted eggs of *Climacteris* species within the sunlit broken dead limbs, or "spouts", enclosing their nests. While the nestling periods of the two genera are similar, arguing against differences in food availability, the remarkably protracted incubation period of the White-throated Treecreeper and, presumably, the Papuan Treecreeper, 4-6 days longer than those of *Climacteris* species (see Breeding), and long incubation bouts, probably evolved as a means of reducing activity at the nest. Such reduced activity may have been more important in protecting the incubating female from being preyed on than in protecting the eggs from nest predators.

Possibly for the same reason, White-throated Treecreepers, in contrast to *Climacteris* species, roost on the surface of tree trunks, rather than inside hollow spouts. Such exposed sites offer unrestricted escape routes from nocturnal predators, whereas hollow spouts potentially become tombs. The rich vocabulary and audible territorial displays of White-throated Treecreepers (see General Habits, Voice) also seem highly adaptive in the context of communication within dimly lit rainforest. Not only would antiphonal calls or duets, as often performed by many *Climacteris* species, be wasted in such an environment, but they could also serve to attract diurnal predators. The most profound difference between the two genera, however, lies in their sociality. Like so many other woodland-inhabiting Australian birds, all *Climacteris* treecreepers commonly live in groups which breed co-operatively, a system contingent on tolerance towards offspring and other kin, and culminating in helping behaviour (see Breeding). On the other hand, co-operative breeding is rare among rainforest-dwellers. It



may therefore be no coincidence that the basically antisocial White-throated Treecreeper expels its progeny as soon as possible, precluding the evolution of philopatry and co-operative breeding behaviour.

The relationship between the two species groups within *Climacteris* is less certain. Whether the "*erythroptus* group" and the "*picumnus* group" are sufficiently divergent to merit generic separation, as has been proposed for the former, for which the name *Climacterobates* has been suggested, can probably be resolved only by further molecular studies.

## Morphological Aspects

The Australasian treecreepers are small, rather stout oscines with a slightly downcurved bill of medium length, a moderately long tail, and relatively short, robust legs with long toes and claws. They range in body length from 14 cm to 19 cm, and in weight from 17 g to 44 g. The posterior surface of the tarsus, the planta, is rounded and unilaminate, unlike the keeled, bilaminate condition of most passerines. Dissections of various muscular systems of climacterids have revealed several unique characteristics of the family. The extrinsic muscles of the syrinx are grossly asymmetric, and fibre orientation is unusual in several respects. In the hindlimb, the muscle *M. iliofemoralis externus* is completely separated from *M. iliotrochantericus caudalis*. At the base of the tongue, *M. thyrohyoideus* consists of two completely independent portions separated at their origin by *M. tracheohyoideus*. Finally, the ligaments that extend the hallux, or hind toe, of most passerines are absent in Australasian treecreepers.

The plumage of climacterids is unremarkable. Broadly speaking, they are uniformly brown or reddish-brown to greyish-brown on the upperside and paler below. The underparts are variably streaked or spotted, and the undertail-coverts are barred. A broad pale wingbar is prominent in flight. The females generally have some reddish colour on the head or breast, such markings being absent on males. Juveniles of most species are duller than the adults, but are otherwise similar to them. Relatively little is known about the moult of the Climacteridae. The juveniles appear to have either a complete moult or a partial one, and most do not

acquire full adult plumage until the second year. Adults have a single annual moult, which they undertake immediately after breeding.

All members of the family are moderately sexually dimorphic in plumage (see also Systematics), and this dimorphism appears surprisingly early in life. In at least three of the seven species, sexual dimorphism develops during the latter half of the nestling stage. The bill and gape-flange of juvenile *Climacteris* treecreepers are predominantly cream-coloured, whereas those of adults are entirely black. In young *Cormobates*, the gape-flange is also cream in colour, but the culmen is blackish, with yellow on the cutting edge and on the base of the lower mandible, whereas adults have the culmen black and a whitish patch on the basal half of the lower mandible. The legs and feet of juvenile *Climacteris* are flesh-grey, with paler claws, whereas those of adults are blackish. In *Cormobates*, in contrast, juveniles have dark olive-brown legs, with bright yellow behind the tibia/tarsus joint, on the tips of the claws, and on the undersides of the toes, features that darken with age.

In addition to differences in plumage, male climacterids are generally significantly heavier than females, and have a longer wing, bill and, often, tarsus than do the latter. The exceptions are the two species of the "*erythroptus* group", the Red-browed and White-browed Treecreepers, which are sexually monomorphic in all measurements, or, in some populations, are slightly dimorphic in wing length only. The bill of Australasian treecreepers is slender, and about one-half to three-quarters the length of the head; it is slightly decurved on the upper mandible, and that of the White-throated Treecreeper has a slight notch on the tip of the maxilla. The slit-like nostrils are partly covered by opercula. Unlike the lyrebirds and the scrub-birds, the Australasian treecreepers have no rictal bristles surrounding the mouth. The tongue of climacterids has frequently been described as brush-tipped and bifid, or two-forked, and these features have been used to support the argument of a common ancestry with the predominantly nectar-feeding honeyeaters of the family Meliphagidae (see Systematics). On closer inspection, however, the tip of the treecreeper tongue is in fact fimbriated (fringed) and quadrid (four-forked), although the lateral notches are poorly defined. Moreover, fringe-tipped tongues are common among oscines that rarely, if ever, feed on nectar, such as mockingbirds (Mimidae) and currawongs (*Strepera*), the latter being members of the butcherbird family (Cracticidae). Honeyeaters exhibit both quadrid and bifid tongues. Although treecreepers do occasionally feed on nectar and sap, they are primarily insectivorous, and they have been observed to protrude the tongue while probing under sheets of peeling bark, or into cylinders of shed bark hanging from branches and twigs. It seems more likely, therefore, that the forked and fringed tip of the climacterid tongue is an adaptation for scraping or possibly ensnaring hidden prey, and sweeping it into the mouth.

One diagnostic characteristic of the Australasian treecreepers becomes obvious only when the birds fly, as it is not until the broad wings are opened that the pale buff to rufous wingbar is starkly revealed. A similarly coloured and prominent wingbar is present in the sittellas (Neosittidae), a feature that was even cited as evidence for a phylogenetic affinity between the two families. The panel spans almost the entire length of the wing, from the innermost of the secondaries to the third outermost of the ten primaries, and is formed by a pale band across the middle third or basal half of each feather, contrasting sharply with the blackish colour of the trailing edge of the flight-feathers and wing-coverts that border it. Given the possible risk associated with flaunting a conspicuous patch of plumage during flight, it seems likely that the wingbar evolved for its use in appeasement or mobbing displays. In addition, the twelve tail feathers feature a broad subterminal band of black, distinct on all climacterids except the Black-tailed Treecreeper and the black form *melanotus* of the Brown Treecreeper.

Unlike their namesakes in the Northern Hemisphere, the Certhiidae, as well as the woodpeckers (Picidae), the Australasian treecreepers lack the pointed tail feathers with thickened shafts that assist the former groups in maintaining purchase while climbing vertical surfaces. Instead, as the detailed anatomical

The Australasian treecreepers are small, chunky passerines with medium-length, slightly decurved bills, fairly long tails, and relatively short, robust legs. The long toes and claws, and particularly the long, curved hind claw, are adaptations for climbing, as they provide a grip on vertical surfaces. It is therefore no coincidence that proportionately the longest hind claw in the genus *Climacteris* belongs to the devoutly arboreal Red-browed Treecreeper. This species is closely related to the White-browed Treecreeper (*C. affinis*), but suggestions that this species-pair merits its own genus can probably only be tested by molecular studies.

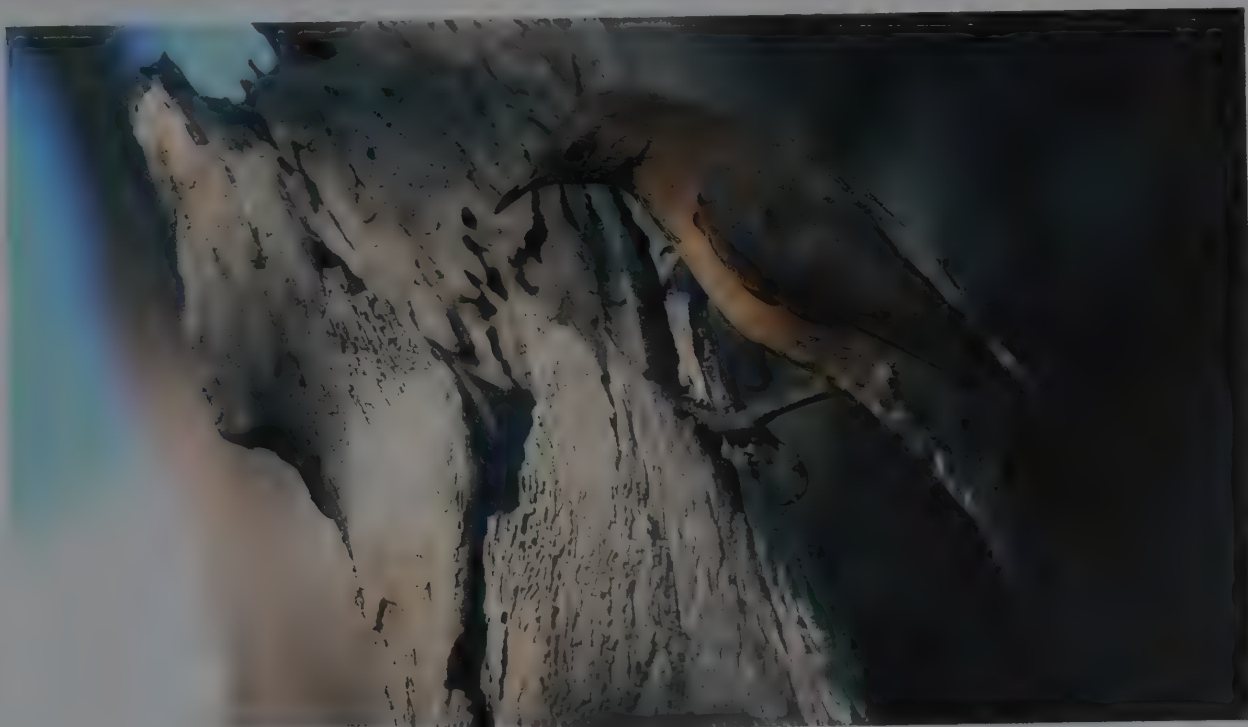
[*Climacteris erythroptus*, McPherson Range, Queensland, Australia. Photo: Graeme Chapman]





Climacterids lack some of the morphological adaptations of other tree-climbing birds, including the stiffened and pointed tail feathers of woodpeckers (Picidae). Instead, they use their stout legs for support when they climb trees, as shown here. A trio of closely related species, including the **Black-tailed Treecreeper**, form a superspecies in the genus *Climacteris*. These species have broader and better-developed foot pads than their relatives, presumably an adaptation for a semi-terrestrial lifestyle.

[*Climacteris melanurus melanurus*, Kakadu National Park, Northern Territory, Australia.  
Photo: Peter Fuller]



studies of Orenstein revealed, the climacterids have evolved longer legs, an increased span of the foot and an elongate hind toe to support the body during the process of climbing. Indeed, the extensor system of the hind claw is unique among passerines, being devoid of both elastic and inelastic ligaments and independent from the extensors of the front toes. Whereas the typical passerine hallucal extensor system permits the release of all toes simultaneously, that of the Australasian treecreepers elevates the hind claw independently of the action of the front toes, giving it greater rotational freedom, and permitting finer adjustments to be made to accommodate irregularities of the substrate. The lack of ligament also increases the strength of the hind claw and contributes to the ability of Australasian treecreepers to withstand compressions and bending forces.

Possession of a long hind claw assists a bird in gripping the substrate, and it is no coincidence therefore that the hind claws which are longest in relation to wing length are found in the most arboreal members of the family, in particular in the Red-browed Treecreeper, the Papuan Treecreeper, and the northernmost race of the White-throated Treecreeper. This adaptation would enable the two last-mentioned species to cling to the typically smooth, unbroken trunks encountered in their rainforest haunts, but it is equally useful to the Red-browed Treecreeper, which forages preferentially on smooth-barked boughs and branches within eucalypt (*Eucalyptus*) forests. The family also exhibits partial syndactyly of the front toes, in which the basal third to two-thirds of the toes are bound together by a common sheath of skin and connective tissue. Beneath this tissue, the third and fourth toes are united for the entire length of the basal phalanx of the former, and the basal phalanx of the second toe is weakly united to the others. Syndactyly may counteract the tendency for gravitational forces to dislocate the toes from the tarsometatarsus.

As with most climbing oscines, the pads on the sole of the foot of an Australasian treecreeper are reduced in size in order to minimize contact between the foot and the substrate, as a result of greater reliance on the large curved claws for support. The degree of modification of these foot pads, however, varies greatly within the family. The slightly broader and better-developed pads of the *Climacteris picumnus* superspecies, namely the Brown, Rufous and Black-tailed Treecreepers, compared with those of the *Climacteris erythrops* superspecies, the Red-browed and White-browed Treecreepers, reflect the greater amount of time spent on the ground by the former. These pads are least developed in the strictly arboreal White-throated Treecreeper, representing *Cormobates*, in which the sole of the hind toe is also

covered in a series of scaly ridges, presumably to increase traction on the substrate. Such ridges are absent from the hind toe of *Climacteris* and other avian climbing genera, but, remarkably, they are present on the African Spotted Creeper (*Salpornis spilonotus*), a member of the Certhiidae. The White-throated Treecreeper is also shorter-legged, especially in the femur and tibiotarsus, and longer-toed than are other Australasian treecreepers. The possession of short legs is probably an advantage to climbers that do not use the tail for support, as it increases the angle between the legs and the trunk, thereby reducing the risk of slippage.



For a small family, the Australasian treecreepers occupy an impressive diversity of habitats. The arid-adapted **White-browed Treecreeper** lies at one extreme, inhabiting acacia and casuarina woodlands in Australia's inland deserts. With the exception of this species and the closely-related Red-browed Treecreeper (*Climacteris erythrops*), male climacterids are significantly heavier, longer-winged and longer-legged than females. All family members are moderately sexually dimorphic in plumage, the female White-browed Treecreeper differing primarily in the rufous upper border to the supercilium.

[*Climacteris affinis affinis*, Yarrara, Victoria, Australia.  
Photo: Peter Fuller]





This **White-throated Treecreeper** has recently finished bathing in a rocky pool. Like other passerines, particularly those inhabiting dusty, arid areas, this species bathes regularly when water is available. Frequent bathing, and the thorough preening which tends to follow, help birds keep their feathers in excellent condition. Given that *Cormobates treecreepers* are significantly more arboreal than those in the genus *Climacteris*, bathing may be the only time that a *White-throated Treecreeper* descends to the ground.

[*Cormobates leucophaea leucophaea*, Jervis Bay, New South Wales, Australia. Photo: Graeme Chapman]

In several features of its hind-limb anatomy, the White-throated Treecreeper, representing *Cormobates*, is more similar to members of other oscine climbing families and genera, such as *Certhiidae* and the genus *Hypositta* of the vangas (*Vangidae*), than it is to other members of its own family, reflecting its disparate and possibly longer evolutionary history (see Systematics).

## Habitat

With the exception of one species found in the mountains of New Guinea, the *Climacteridae* are confined to the Australian mainland. Their absence from Tasmania, and from all of the large forested islands close to the Australian mainland, suggests an inability to traverse sea barriers as narrow as 13 km. This explanation is consistent with their apparently weak flying capabilities, consisting of gliding or undulating flights (see General Habits). It is, nevertheless, also possible that an impoverished insular bark-dwelling arthropod fauna, or competition from other bark-foraging species, may have contributed to the demise of any treecreepers that made a successful sea crossing. The curious disjunction in the distribution of the mountain-dwelling Papuan Treecreeper, however, seems to defy explanation. The range of this species spans the 1600 km of the central cordillera running from east to west through New Guinea, except for a 400-km gap in the central-east part where suitable habitat abounds and competing species are absent.

For a small family, the Australasian treecreepers occupy an impressive diversity of habitats. At one extreme is the Papuan Treecreeper, a denizen of the perpetually damp, moss-covered montane rainforest and subalpine forest up to 3000 m above sea-level in tropical New Guinea. At the other extreme is the arid-adapted White-browed Treecreeper, which occupies acacia (*Acacia*) and casuarina (*Casuarina*) woodlands scattered throughout the inland deserts of southern Australia. The least habitat-specialized member of the family is the White-throated Treecreeper, which is as much at home in subtropical lowland rainforest and cool temperate forest, dominated by southern beech (*Nothofagus*), as it is in eucalypt forests and woodlands. Unlike other, sympatric climacterids, this species is able to survive also in plantations of the exotic Monterey pine (*Pinus radiata*). This habitat tolerance brings the White-throated Treecreeper into fre-

quent contact with the Brown and Red-browed Treecreepers. Interspecific conflict with the Brown Treecreeper is minimized by the latter's semi-terrestrial habits and preference for open spaces. Despite differences in preferred bark types, however, aggressive interactions between Red-browed and White-throated Treecreepers occur regularly, although such encounters are brief owing to the constant dominance of the former, despite the fact that the two species are almost identical in size.

A remarkable range of bark types among co-occurring eucalypt species provides the basis for the partitioning of resources, not only among co-existing and potentially competing species of treecreeper, but also between their sexes (see Food and Feeding). Red-browed Treecreepers consistently forage to a greater extent than do White-throated Treecreepers in eucalypt species with smooth branches or trunks, such as gums, boxes and peppermints, where they concentrate on patches of peeling or shed bark, while the latter species prefers rough-barked trees such as stringybarks and ironbarks.

Non-random habitat use by the semi-terrestrial, co-operatively breeding Rufous Treecreeper has been demonstrated at three spatial scales in the wheatbelt region of southern Western Australia. At the landscape level, wandoo (*Eucalyptus wandoo*) woodland was utilized at a significantly greater rate than were three other widespread vegetation types. Within these woodlands, territory use was positively related to the density of hollow-bearing logs, the density of potential nest-sites, and tree age. Hollow logs provide protection from predators, especially for vulnerable fledglings. Large, old wandoo trees were preferentially selected for foraging. The quality of territories occupied by Rufous Treecreepers was found to have a significant effect on group productivity in terms of the number of fledglings produced per breeding group per season, as well as on the number of fledglings surviving to independence, the number of juveniles surviving to the next breeding season, and the probability of the primary male, but not the primary female, surviving from one breeding season to the next (see Breeding).

## General Habits

During typical foraging activities, Australasian treecreepers launch themselves from the upper portion of one tree and plane



down to a lower position on the next tree. Over longer distances, they use undulating flights, comprising short bursts of flapping interspersed with long glides. Treecreepers normally progress vertically up tree trunks, rather than spirally, and climb outwards along limbs, sometimes upside-down on the underside of branches. When they are climbing vertically, the axis of the body is oriented parallel to that of the trunk, but the legs are held obliquely and widely separated; the forward one is under tension, while the back one is under compression. During movement, the feet are not lifted simultaneously but, rather, the lower foot is released and brought up to the level of the upper one, which is then moved higher. At irregular intervals the placement of the feet is swapped, with an associated slight shift of the body axis. This process is known as "inching", to distinguish it from the "hitching" technique of the unrelated certhiid treecreepers and from "reverse-hopping" families such as the nuthatches (Sittidae) and sittellas. Whereas hitchers maintain purchase on the substrate by using the tail as a brace, inchers and reverse hoppers have longer legs, an increased span of the foot and an elongate hind toe. Occasionally, Australasian treecreepers hop backwards for short distances, but they never assume the upside-down vertical postures of the sittellas during normal foraging activities. *Climacteris* species spend up to half of their time on the ground, where they hop with the feet held parallel and the legs somewhat spread.

A conspicuous characteristic of the *Climacteris picumnus* superspecies, the Brown, Rufous and Black-tailed Treecreepers, is the incessant "twitching", "flicking" or bobbing of the tail, which appears to involve both spreading and up-and-down movements, performed simultaneously. The frequency of tail-twitching varies from two or more flicks per second, as when the individual has recently been disturbed by an intruder, to just a few each minute, as during preening, indicating that its intensity may be related to the nervousness of the display or to the threat posed by the intruder. The fact that the three members of this superspecies are the most social species in the family suggests that this visual display may have evolved as a means by which an individual can alert other members of its group to the presence of intruders, such as individuals from neighbouring territories. Since the birds often tail-twitch when they are alone, however, it seems possible that the function of the display is to warn the intruder that the displayer has detected it.

Just as the two genera of Australasian treecreepers differ markedly from each other in morphology and egg characteristics, indicating a major evolutionary divergence, so do they differ also in their social organization. Although all members of this family are sedentary, holding permanent all-purpose territories that are defended throughout the year, the number of occupants and their behaviour towards each other vary dramatically between *Cormobates* and *Climacteris*. The well-defined territories of the rather unsocial White-throated Treecreeper, in *Cormobates*, are occupied by pairs or by single unpaired males, the latter representing up to 30% in one study population; and, while paired males forage with, and feed, their mates during the breeding season, outside this period each sex tends to occupy, and even defend, separate parts of the combined territory, which covers an area usually of 2–7 ha. The boundaries of territories often shift, such as when one or both members of a pair disappear or when immigrants establish territories among existing ones. Most territories are acquired by the filling of breeding vacancies that arise when a breeder dies or disperses, yet a surprisingly high percentage of vacancies, about 23%, remained unfilled in one study.

White-throated Treecreepers defend their territories vigorously, using a graded series of signals. Males advertise their occupancy of a territory by giving "Piping Calls" or "Crescendo Calls" (see Voice) while patrolling the boundaries. Threat displays start with the raising of the crown feathers and tail-fanning, but even between pair-members this often quickly escalates into audible "tail-clicking", in which one or both birds repeatedly spread the tail partially for a split second, while climbing adjacent trees, usually at the same height. Moderately intense interactions consist of supplantings or chases, generally involving unmated males or mated partners, the female often being the aggressor. When neighbouring males are fighting over a female,

however, physical violence often erupts, the birds scrambling with the feet and claws in mid-air or while scampering up tree trunks with tail-clicks, and sometimes tumbling to the ground with their legs entwined. When a breeding male is lost, it is rapidly replaced; but, when a female disappears, the male may remain unpaired over one or more breeding seasons, before attracting a new mate. Breeding by White-throated Treecreepers is never a group affair; even when a female pairs with two males, the latter aggressively defend adjacent territories. Neither sex is consistently dominant in such interactions.

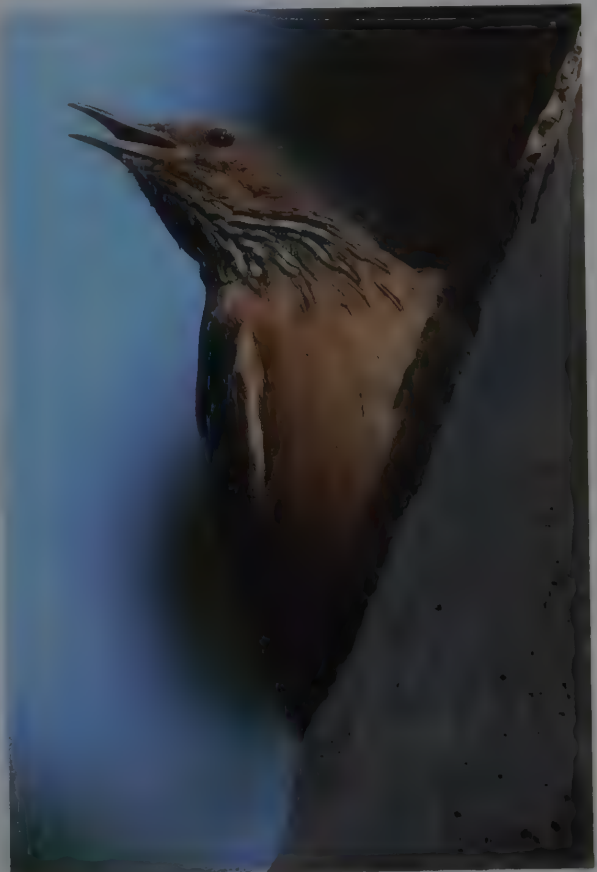
In stark contrast, the *Climacteris* treecreepers live in pairs or in groups of 3–8 individuals, the latter consisting of a breeding pair and its male and, rarely, female offspring from previous breeding seasons. These groups breed co-operatively (see Breeding), and all group-members defend the territory.

Among most *Climacteris* species, a social dominance hierarchy is evident, one in which males are invariably dominant over females, regardless of age, and younger individuals are subordinate to older ones of the same sex. During potentially aggressive encounters, dominant individuals puff the breast and/or flatten the throat feathers, displaying the sexually diagnostic markings (see Morphological Aspects), and approach their rival while holding the head and neck stretched forwards. The subordinate bird usually appeases the dominant one by crouching, with the head lowered, and the wings raised over the back and fluttered. In the case of the Brown Treecreeper, an aggressor sometimes dives towards the ground from a high perch, gliding on upstretched wings and twisting its body, presumably to accentuate its attack and intimidate its opponents; this gliding flight has been termed "Butterfly Flight". Fighting occurs mostly during conflicts over breeding positions, and usually entails two males jabbing at each other with the bill, and scrambling to get a grip of each other with the feet. Once the feet are interlocked, the birds tumble to the ground, where they may roll around for several minutes, before the loser flees. Such fights can result in injuries, including sores on the face, infected eyes and severe bruising of the abdomen. Territory wars result from coalitions of male helpers trying to force out the neighbouring breeding male and his male helpers. All male group-members, and also extra-group helpers, de-

The *Climacteris* treecreepers have a limited repertoire of just four to six vocalizations. Duets are produced by some species, such as the Black-tailed Treecreeper. Two or more birds call simultaneously, or antiphonally, each giving a different sequence of excited notes. Interestingly, this species lacks a distinctive vocalization of its two closest relatives, the Brown Treecreeper (*C. picumnus*) and Rufous Treecreeper (*C. rufus*). Both these semi-terrestrial species give a churring call when they detect terrestrial predators. It has been argued that the Black-tailed Treecreeper may have no need of this particular alarm call in its vocal armoury, as it is an almost entirely arboreal species.

[*Climacteris melanurus* melanurus, Kakadu National Park, Northern Territory, Australia.

Photo: Peter Fuller]





fend the territory from invading coalitions. In one instance, six brothers on their natal territory succeeded in evicting the breeding male on an adjacent territory after several weeks of fighting, including prolonged chases punctuated by physical skirmishes. The oldest of the invading cohort paired with the resident female, and the ousted males became floaters on several neighbouring territories.

The behaviour of parents towards dispersing offspring seems to hold the key to an understanding of the striking differences in social organization between the family's two genera. While co-operatively-breeding *Climacteris* species display parental tolerance, non-co-operative White-throated Treecreepers chase their offspring whenever they find them, explaining why dispersing juveniles of the latter are very surreptitious when moving through the natal territory. These differences in parental tolerance may, in turn, be related to differences in the tactics that they use in order to avoid predation, particularly at the nest. White-throated Treecreepers make use of concealment, remaining silent and immobile once a predator has been detected, and activity at the nest is reduced through very long incubation bouts and low rates of feeding both the incubating female and young (see Breeding). In contrast, Brown Treecreepers have short incubation bouts, and feeding rates at the nest are generally higher because of the provisioning efforts of helpers. Potential nest predators, such as snakes, monitor lizards (*Varanus*), small carnivorous marsupials known as marsupial mice (*Antechinus*), and also possums (Phalangeridae), are actively mobbed by all group-members, which give distinctive alarm calls and utilize a variety of displays, including spreading of the wings, rocking back and forth, and making low swoops and short butterfly flights. In short, the main reason why juvenile White-throated Treecreepers are not tolerated on their natal territory may be that their activity near the nest will make the latter more conspicuous to nest predators. Brown Treecreepers, on the other hand, welcome their offspring because vigilance and predator-mobbing are more effective if performed by a large group.

Despite their social tolerance, *Climacteris* species sleep alone at night. They usually roost inside hollow tree trunks or in spouts similar to those chosen for their nests, and they are consequently well protected both from the weather and from predators. In contrast, the White-throated Treecreeper, and doubtless also its con-

gener, the Papuan Treecreeper, typically roost on the surface of trunks, exposed to the elements. Free of the nocturnal requirement for hollow limbs, White-throated Treecreepers have been found sleeping in an amazing variety of sites, including the walls of houses and of public toilets, a chimney, and the ceiling of a cave. This species and its congener most likely evolved in mossy rainforests, where tree hollows suitable for roosting may be scarce as a result of the rapid decomposition of dead spouts or the smothering of them by epiphytic plants. Roosting on exposed vertical surfaces, however, also offers the benefit of unrestricted escape routes from predators. Given that nocturnal predators, such as most snakes and carnivorous marsupials, rely on their sense of smell rather than on vision, there seems to be no advantage in roosting inside tree hollows. Hole-roosting by *Climacteris* species may, therefore, have evolved as a means of thermoregulation during the cool to cold nights in inland Australia. Young Brown and Rufous Treecreepers often retreat to large tree holes and hollow stumps to escape predation, but such attacks tend to involve diurnal aerial predators. Roost-sites are often used on consecutive nights, but individuals may use three or more widely spaced sites over the course of a month.

For those species for which relevant information is available, comfort behaviour is as would be expected. Preening is frequent in occurrence, and bathing takes place fairly regularly when water is available. White-throated Treecreepers, when bathing, were reported as repeatedly entering the water until they were thoroughly wetted, this behaviour being accompanied by frequent calling.

### Voice

Australasian treecreepers give their typically staccato contact calls frequently through the day in all months of the year. Each species has distinctive vocalizations, but the calls of the *C. picumnus* superspecies (see Systematics) are similar to one another in quality, if not in pitch and pace. The White-throated Treecreeper has the most impressive repertoire, with some ten distinct calls, several of which are sex-specific. The male uses loud tremulous "Crescendo Calls" or rapid "Trills" in encounters with the female, particularly when feeding her during the courtship and incubation stages. When off the nest during the incubation period, the



During typical foraging activities, Australasian treecreepers climb a tree trunk until they reach its upper part, then swoop down to a lower position on a neighbouring tree where they repeat the process. They climb trunks vertically, rather than spirally, and forage outwards along branches, sometimes hanging upside-down on the underside of limbs. The White-throated Treecreeper usually spends around one minute on each tree, scouring up to a fifth of it. Climbing birds keep the body axis parallel to the trunk but hold the feet obliquely and widely separated.

[*Climacteris leucophaea*  
*leucophaea*,  
Mount Ida, Heathcote,  
Victoria, Australia.  
Photo: Andy & Gill Swash]

*Australasian treecreepers primarily eat arthropods such as ants, spiders, bugs, flies and beetles, which they find lurking on or beneath tree bark, or on the ground. They capture most of their prey by gleaning, but will also probe, hammer or pull loose bark, flicking out insects. Like some other bark-foraging birds, there are intersexual differences in the foraging behaviour of the White-throated Treecreeper. Males tend to forage higher up in trees than females, and may also spend a greater proportion of their time foraging on trunks and dead branches. It has been speculated that such differences may result from bark-dwelling arthropods being relatively scarce or patchily distributed in space and/or time.*

[*Cormobates*

*leucophaea metastasis*,  
Moggill State Forest,  
Brisbane, Queensland,  
Australia.

Photo: Raoul Slater/  
Lochman Transparencies]

female gives muted, insect-like monotonal notes, possibly to assist the male in locating her. As he approaches her with food, her calls increase in pitch and speed until they resemble the begging call of dependent fledglings. Moreover, nestlings emit an explosive chatter of eight or more notes, quite unlike any call given by adults. The information that these diverse vocalizations convey seems particularly adaptive in rainforests, the likely original habitat of this species and the sole habitat of its Papuan congener, as the dense vegetation and often low light conditions reduce opportunities for visible contact.

*Climacteris* species have only four to six vocalizations, and none of these appears to be sex-specific. The simplest vocabulary would seem to belong to the White-browed Treecreeper, the penetrating insect-like calls of which may be related to long-distance communication near ground level in its lightly wooded semi-arid habitats. Members of pairs or groups of Red-browed Treecreepers, on the other hand, while foraging high in tall eucalypt forest, keep in close vocal contact by using short antiphonal calls, in which a descending chatter from one individual is followed immediately by a sharp disyllabic retort from another, with little overlap. Despite these totally dissimilar adult calls, the common ancestry of these two closely related species is reflected in the cricket-like begging calls of their nestlings. In the case of the Brown and Black-tailed Treecreepers and probably the Rufous Treecreeper, however, accelerating calls uttered by one member of the group sometimes induce another member to call simultaneously, thus forming a duet, which lasts as long as three seconds, each bird giving a quite different sequence of notes. As with the White-browed Treecreeper, the begging calls of nestlings of these three species are essentially higher-pitched versions of the adult calls.

A distinctive vocalization of both Brown and Rufous Treecreepers is the dissonant rasping chatter, or "Churring Call", given when these species are disturbed by human intruders or are mobbing potential predators. This alarm call is heard most frequently when the birds are flushed from the ground, although it is occasionally uttered as they climb or perch on trees. The fact that it is absent from the repertoire of the Black-tailed Treecreeper, which rarely forages on the ground, suggests that the call may have evolved in response to the threat imposed by terrestrial predators. Since group-living, duetting and tail-twitching (see General Habits) are practised by all three members of the superspecies, whereas alarm calls are not, it is possible that the Black-tailed Treecreeper lost these calls secondarily, after forsaking the ground as a foraging substrate. Whether the function of the alarm call is to warn, or draw together, other members of the group, or to communicate the caller's alertness to the predator, remains unclear.

## Food and Feeding

Climacterid treecreepers eat a wide variety of arthropods found on or beneath the bark of trees, as well as on the ground. In addition, they occasionally feed on tree sap and at times take nectar from flowers.

The stomachs of collected specimens of all Australian members of the family invariably contain many ants (Formicidae), and often little else, leading to the impression that they are ant specialists. Ants, however, because of their hard exoskeleton, are retained in stomachs for longer than are most other arthropods, resulting in overestimates of their importance in avian diets. Moreover, despite the abundance of ants in conspicuous and predictable locations, climacterids visit hundreds of trees daily and spend over 80%, and up to 96%, of the day in foraging, indicating that they are seeking other, more nutritious prey. In north-east New South Wales, the greatest number of ants was eaten during the colder months of the year, when other surface-dwelling arthropods were scarce, suggesting that ants may provide a reliable staple. Thus, rather than gorge on ants, treecreepers apparently snap up individuals opportunistically while searching for more energetically rewarding prey, such as larvae and spiders (Araneae); ants are relatively indigestible, but they are energetically "cheap" to obtain and are a possible source of sugars, which



they sometimes store in the abdomen. Nevertheless, they are rarely, if ever, fed to young.

Australasian treecreepers capture most of their prey by gleaning it from the bark or ground surface, often while actively climbing or hopping, and pausing for only a second. In addition, they commonly probe loose strips of peeling bark while flicking the quadrifid tongue (see Morphological Aspects) rapidly in and out, possibly to ensnare hidden insects. Although they lack the cranial modifications required to enable them to excavate wood, climacterids often hammer and tug at the fibrous or flaky bark of rough-barked eucalypts for periods of, on average, 10–25 seconds in order to expose hidden prey. Two studies of co-existing White-throated and Red-browed Treecreepers in north-east New South Wales showed that both species usually landed and started foraging on tree trunks or boughs at heights of less than 10 m, and, although they may continue to the top of the tree, the average time spent on each tree was about 50–60 seconds, during which they covered less than 20% of the total tree height. Both species selected trees with a diameter at breast height greater than 35 cm more often, and smaller trees less often, than would be expected by chance. The modal distance flown between successive foraging trees was 3–6 m, although one flight was as far as 84 m. Australasian treecreepers occasionally pursue flying insects in the air, and in north-east Queensland a White-throated Treecreeper was observed as it repeatedly chased prey that had been flushed from vegetation.

As with many bark-foraging birds in the Northern Hemisphere, including many species of woodpecker and the Eurasian Treecreeper (*Certhia familiaris*), the sexes of at least two species of the Climacteridae differ in their foraging behaviour. At sites in both north-east and south-east New South Wales, female Red-browed Treecreepers foraged at levels higher than those exploited by males; in the south-east, they tended to forage on trunks more and on branches or loose bark less than males, whereas the inverse was true in the north-east. Male White-throated Treecreepers foraged higher up than females in both regions, but males in the south-east foraged more on trunks, whereas





*The Brown Treecreeper is among the most terrestrial members of Climacteridae. It spends roughly equal amounts of time foraging on the ground and in trees, except in winter and spring, when terrestrial feeding is more frequent. Its taste for ground-dwelling prey may explain its preference for woodlands with an open grassy understorey and a poorly developed shrub layer, conditions that make it easier to forage terrestrially. Even when searching for food in trees, the Brown Treecreeper displays a marked reluctance to venture above the lower levels.*

[*Climacteris picumnus victoriae*, Brisbane Ranges National Park, Victoria, Australia. Photo: Peter Fuller]

those in the north-east foraged on dead branches more than females, at least while breeding. Thus, while intersexual differences in foraging substrates are typical for these species where they co-exist, the nature of these differences seems to be spatially and temporally inconsistent. It is almost certainly no coincidence that intersexual foraging differences have been found only in the two most arboreal of species, disregarding the Papuan Treecreeper, and have not yet been detected among the partly terrestrial species.

The presence of intersexual foraging differences among climacterids, as well as in two other bark-foraging specialists in Australia, namely the Varied Sittella (*Daphoenositta chrysoptera*) and the Shrike-tit (*Falcunculus frontatus*), suggests that bark-dwelling arthropods are relatively scarce or patchily distributed in space and/or time. Indeed, in a forest bird community of south-east New South Wales, intersexual differences were most pronounced among bark-foragers and least developed in ground-foragers, reflecting the reduced options for the partitioning of resources on a single, horizontal plane. In the wandoo woodland of south-western Australia, the Rufous Treecreeper foraged primarily on trees in the autumn, but doubled its use of the ground in winter, suggesting that, during the winter months, arthropod abundance on the ground declines less than that on bark. In agricultural areas only 35 km away, however, this species foraged less on the ground in all seasons, perhaps because of the high density of exotic weeds.

## Breeding

Typically for Australian passerines, the breeding season of treecreepers is long, at least for those of the genus *Climacteris*. Egg-laying usually starts towards the end of the austral winter, in August or even late July, and continues for three to five months. This allows time for potentially two or three broods to be reared, although most nest attempts represent replacement clutches, following the failure of previous nestings; up to six such attempts have been recorded for the Brown Treecreeper. The propensity for second broods, following successful fledging of offspring from earlier broods in the same season, varies among species, populations and years. White-throated Treecreepers rarely attempt to raise a second brood, whereas in one population of Rufous

Treecreepers 46% of the groups attempted to do so, and of these groups 75% were successful. In semi-arid Victoria, 77% of breeding White-browed Treecreepers had second broods in one year when rainfall, especially during the month preceding laying, was above average, whereas none did so in the previous year, when rainfall was below average and egg-laying started later.

*Cormobates* species never breed co-operatively. A female White-throated Treecreeper sometimes pairs with two males, but the males defend two, adjacent territories. In stark contrast, the *Climacteris* species frequently breed in groups, the latter consisting of a socially monogamous breeding pair and its retained male and, rarely, female offspring from previous breeding seasons. These groups breed co-operatively, the offspring helping their parents in the building and defence of nests, in the feeding of the breeding female and in the care of the young. Among White-browed and Red-browed Treecreepers, one-third to two-thirds of pairs, respectively, have a helper or, rarely, two or three helpers, invariably males. In the case of Brown and Rufous Treecreepers, on the other hand, 38% of pairs of the former and 59% of the latter may have up to six non-breeding helpers, invariably males, which may stay in the natal territory for four or more years. Intensive studies of these two species have, however, revealed a complex and possibly unique territorial and co-operative breeding system. Up to six, but more usually two or three, contiguous territories can form what has been termed a "super-territory", within which many individuals help at several concurrently active nests.

In addition to having resident helpers within the group territory, or intra-group helpers, the majority of groups received assistance also from up to five individuals from other territories, or extra-group helpers. Within such "super-groups", territorial boundaries were almost irrelevant for males, which fed nestlings, fledglings and even incubating females in up to five, but more usually two or three, territories on the same day, sometimes visiting two nests within an interval of 15 minutes. Although the genetic relatedness among individuals within super-groups awaits analyses of their DNA, all males in one long-term study appeared to be closely related, being in most cases father and son, brothers or half-brothers. While males never defended their territories against members of their own super-group, females defended against intrusions by females from other territories within the super-territory. Super-groups may form when non-breeding broth-

There is no evidence that Australasian treecreepers feed on aquatic invertebrates, and this **Brown Treecreeper** is probably visiting a pool to drink. This behaviour is probably common in climacterids, given their habitat and diet. Some of their favourite foods, including ants, nectar and sap, are sources of sugars, which are sometimes stored in the abdomen. The Brown Treecreeper will also glean or probe bark and crevices for arthropods such as spiders and beetles, and occasionally it even makes aerial sallies after wasps and flies.

[*Climacteris picumnus picumnus*,  
Epping Forest  
National Park,  
C Queensland, Australia.  
Photo: Roland Seitze]



ers acquire adjacent territories through take-overs or through what has been termed "budding", in which a non-breeding male establishes his own breeding territory on a portion of his natal territory. Budding causes shifts in territory boundaries, as does the disappearance of one or both members of a breeding pair or the pairing of adjacent widowed birds.

Courtship consists primarily of the male, while calling, feeding the female. With an insect in his bill and the feathers of his crown raised, the male White-throated Treecreeper usually approaches the female from below, sometimes lowering and shivering his wings while giving trill calls (see Voice). The female may repeatedly reject the offering, even tossing it away after taking it, after which the male will retrieve the food and eventually eat it. Prior to copulation, the male emits repeated crescendo calls (see Voice) from a horizontal perch, lowering his head and body while partly cocking his tail and shivering his wings. When the female arrives, he may lift his wings and tail until they are nearly vertical and then rock slowly from side to side, or simply chase her, until copulation occurs, this taking place on a vertical or horizontal surface. No such elaborate pre-copulatory display by the male has been recorded for the other members of the family. In the case of Brown and Rufous Treecreepers, after the breeding male has presented his offering to the breeding female, the latter may give an "Appeasement Display", sometimes with soft begging calls and tail-fanning; both then spend up to several minutes in hopping excitedly between logs or branches, heads bobbing up and down as if bowing when facing each other, until the female crouches on a horizontal perch, quivering her wings and elevating her tail, before the male mounts her.

Treecreepers are virtually unique among Australian passerines in being obligate tree-hole-nesters. As the region has no excavating birds, such as woodpeckers, tree hollows are the result of microbial action and termites (Isoptera), and it may take 100 years or more for them to develop in the hard-wooded eucalypts. Not surprisingly, therefore, nest-sites are often used more than once, although rarely in the same season. While, in natural circumstances, nests are invariably built in hollow branches, trunks or knotholes of living or dead trees, climacterids have been known to nest in ventilation pipes, in chimneys, under eaves of buildings, in earthen tunnels and, often, in hollow fence posts and nestboxes. An old kettle, hanging from a fence post, was used for

eight consecutive years by one pair of Brown Treecreepers. Within an individual territory, Rufous Treecreepers preferred tree-hollow nest-sites with a spout angle of more than 50° to the horizontal, and with an entrance diameter of 5–10 cm.

Nest-building for the White-throated Treecreeper is the task exclusively of the female. With the *Climacteris* species, however, males often bring materials such as feathers with which to line the nest, helps sometimes queuing for the opportunity to add to the lining. The construction work takes 1–2 weeks to reach completion, but some birds continue to add lining during the incubation and nestling stages. As eggs are sometimes covered, at least partially, by this behaviour, it is possible that it serves to conceal the nest contents from predators.

The nest itself is a thickly woven cup composed mostly of dried grasses and strips of bark, and lined with fur, wool, feathers, plant down, bark fibres, leaves, moss and/or snakeskin. As hollow spouts may be deep, however, they are often packed with up to 40 cm of bark, grass and kangaroo or horse dung, and sometimes charcoal, on top of which the nest is then built, some 8–60 cm from the entrance. The diameter of the nest entrance typically ranges from 6 cm to 12 cm, but some are as narrow as 3 cm, and others are wide enough to be utilized subsequently by birds as large as rosellas (*Platycercus*), Laughing Kookaburras (*Dacelo novaeguineae*) and Dollarbirds (*Eurystomus orientalis*).

Chemical protection of the nest may be the function of "Bill-sweeping", a peculiar behaviour of Australasian treecreepers displayed during the nest-building, laying, incubation and early nestling stages. An adult takes an object to the nest, and then frenetically wipes it back and forth on the wood or bark just inside, around and up to 2 m above and below the nest-hole, as well as on surrounding trees up to 20 m away. The objects used are varied, and include insects or their wings, snakeskin, fur, wool, and even fragments of plastic bags, and the behaviour usually lasts for about 5–15 minutes, but may continue for up to 30 minutes or until the object has almost disintegrated. This ritual is performed by both sexes of the co-operatively breeding Brown and White-browed Treecreepers but, in the case of the White-throated Treecreeper, by the female only, consistent with her lone role in nest-building. The abrasive action of bill-sweeping may serve to erase or disrupt scent marks made by hole-roosting mammals such as possums, which occasionally cause the birds to abandon



nests. Alternatively, the chemical properties of the object may repel potential nest predators such as arboreal lizards, snakes and ants. Similar behaviour is demonstrated in North America by White-breasted Nuthatches (*Sitta carolinensis*), which sweep the bark surrounding their nest-holes while holding beetles; these insects excrete oily fluids that may repel or erase the scent trails of such hole competitors as squirrels (Sciuridae).

The clutch size, typically small for Australian oscines in general, varies between one and three eggs for most Australasian treecreepers, but the average is slightly less than two for three species, and closer to three for the well-studied White-throated and Brown Treecreepers. The interval between the completion of the nest and the laying of the first egg is 7–15 days. The eggs of the *Climacteris* species are probably laid at 24-hour intervals. As with most of the thornbills and bowerbirds, however, White-throated Treecreepers, representing *Cormobates*, lay on alternate days, at intervals of 30–48 hours. At least some second and third eggs of a clutch are laid in the early to middle part of the afternoon. The two genera differ profoundly in egg coloration, the eggs of the White-throated Treecreeper being white with few dark brown to blackish markings, whereas those of *Climacteris* are suffused with pink and densely marked with reddish-brown and lilac-grey spots. Likewise, there are marked differences between the genera in the duration of the incubation period. Despite having relatively protected nest-sites, *Climacteris* species have an incubation period of 16–18 days, similar to that of many other Australian passerines that have much more vulnerable open cup-nests. The White-throated Treecreeper, however, has an incubation period of 22–23 days, suggesting that its eggs are less susceptible to predation than those of treecreepers in the genus *Climacteris*, or that its surreptitious behaviour and lower visitation rates at the nest compensate for the prolonged exposure of its eggs to nest predators.

Among all members of the family, it is the female alone that incubates, spending 60–75% of the day sitting on the eggs. Although she forages for herself while she is off the nest, she is also fed by her partner and, in the case of *Climacteris* species, by helpers, at the entrance to the nest or, more commonly, away

from the nest. When the female White-throated Treecreeper is off the nest, she utters a distinctive "Incubating Call", apparently to encourage the male to feed her. The male, in contrast to when he is courting her, does not call or display when offering food, and flies off immediately after his partner has accepted it. Female White-throated Treecreepers are fed by their mates 1.4–1.9 times per hour at the nest, but an average of 17 times per hour away from the nest. Female Brown Treecreepers, on the other hand, are fed up to six times per hour at the nest alone, helpers providing up to half of the food.

Hatching is usually synchronous, but in some nests the chicks may hatch at intervals of up to 48 hours. The hatchlings are naked except for long tufts of down on the crown and mantle; the remiges appear on the fifth or sixth day, and the rectrices two days later; the eyes open 9–10 days after hatching, when pinfeathers emerge on the underparts. Adult weight is reached by 13 days, and after 15 days the chicks often exceed the average weight of adults of their respective sex. Both parents, and also, in co-operative groups, helpers, feed the young and remove their faecal sacs, although only the female broods the young, in the case of the White-throated Treecreeper for up to 14 days after they hatch. Males continue to feed the incubating female for a few days, although she may pass this food on to the chicks. Feeding rates at the nest vary with the number of helpers, the age of the nestlings, the prey size, the weather and the time of day, but typical rates are in the range of 10–20 feeds per hour. The nestling periods of most climacterid species, typically 25–28 days, are among the longest of those of all Australian passerines, and almost double that of many slightly smaller members of other families. As reasoned above, the slow development of young treecreepers is presumably facilitated by the protection from predators afforded by nesting in hollows. In at least two species, single parents of either sex are capable of successfully raising broods after their mate disappears during the nestling phase, and possibly even if the partner disappears before the eggs hatch.

Despite the relative safety of nest-holes, however, the breeding success and productivity of Australasian treecreepers are not particularly high, and show surprising geographical variation. In

*Climacterid treecreepers are virtually unique among Australian passerines in that they nest only in holes. Since there are no woodpeckers in Australia, tree hollows only develop with microbial and termite action, which means that it may take a hundred years to create a suitable cavity. Suitable treecreeper nest-sites are thus at a premium, and it is not surprising that they are both staunchly defended and used in successive years. This White-throated Treecreeper has been fortunate enough to find a natural hole, but climacterids will also use artificial cavities such as ventilation pipes, chimneys, hollow fence posts, nestboxes and even, on occasion, an old kettle.*

[*Cormobates leucophaea metastasis*, Brisbane Forest Park, SE Queensland, Australia. Photo: Brian Coates]



*Climacteris treecreepers* such as the **Rufous Treecreeper** breed co-operatively. Groups of up to six individuals consist of a breeding pair, its male and (rarely) female offspring from earlier breeding events, and sometimes even non-breeding birds from adjacent territories. These helpers defend the territory, build nests, feed the female and tend the nestlings. A pair's breeding success appears closely correlated to the amount of help they receive. Pairs with helpers produce more fledglings, and the greater the number of those helpers, the higher the breeding success.

[*Climacteris rufus*,  
Yardea Station,  
Gawler Ranges,  
South Australia, Australia.  
Photo: Graeme Chapman]



north-east New South Wales, the percentage of White-throated Treecreeper nests producing fledglings was 68%, and the mean annual productivity per breeding pair was 1.3 fledglings, whereas nest success and productivity in central-west New South Wales were less than half of those figures, being 24% and 0.54, respectively. Similarly, for Brown Treecreepers at the same study sites, the mean annual productivity per breeding group in the north-east was 1.36, about twice that at the central-west locality, where only 0.74 fledglings were produced per breeding unit. These apparent differences in reproductive success may be due to higher rates of nest predation in central-west New South Wales, which may, in turn, be due to a lower diversity and/or density of nest predators in the more fragmented landscape of north-east New South Wales. In Western Australia, nest success and mean annual productivity of Rufous Treecreepers were much higher in an unfragmented landscape than in a fragmented one: in the former, 77% of nests were successful and a productivity of 2.2 fledglings per nest was achieved, whereas the corresponding values for the fragmented landscape were 46% and 1.1 fledglings. Further, the breeding success of this species was higher on territories with a greater density of hollow-bearing logs, which are used as shelters in which to hide from predators.

Among both Brown Treecreepers and Rufous Treecreepers, pairs with helpers invariably produce more fledglings than do those without, and reproductive success is correlated with group size. Without helpers, breeding males and females contribute equally to the provisioning of the nestlings, but, as the number of helpers increases, breeders reduce their provisioning contributions. Breeding females assisted by many helpers at their first nests are more likely to re-nest after a successful attempt. In one population of Brown Treecreepers, both the number of extra-group helpers and their feeding rate were negatively correlated with the breeding experience of the breeding male. Thus, inexperienced breeders were assisted by neighbouring relatives, apparently to compensate for their lack of intra-group helpers. Of the extra-group helpers recorded in a population of Rufous Treecreepers, 70% helped in territories that were of a higher quality than their own. Conceivably, groups in better-quality territories produce more offspring to fill nearby vacancies, which act as a reservoir of potential helpers in future years. Alternatively, non-breeding extra-group helpers may use the behaviour of helping as a means of assessing the quality of adjacent territories.

For up to five days after leaving the nest, the young of most *Climacteris* species shelter in hollow logs or large tree hollows, where they are fed by all members of the group. In contrast, newly fledged White-throated Treecreepers, in the genus *Cormobates*, perch and climb, albeit clumsily, in the open. Feeding rates decrease gradually until the young become independent, which, for most species, happens 30–40 days after fledging. Indeed, in the case of the co-operatively breeding Brown and Rufous Treecreepers, first-brood juveniles no more than 45 days after fledging are capable of helping their putative parents with the feeding, and even the removal of faecal sacs, of nestlings of later broods in the same season. This is unlikely to occur with the Red-browed Treecreeper, adults of which are known to feed their young for at least 60 days after the latter have left the nest, possibly because the relatively specialized foraging niche of this species, combined with sexual differences in foraging behaviour (see Food and Feeding), may require a longer period of apprenticeship.

In all species of the Climacteridae hitherto studied, both sexes are capable of breeding in their first year, and nearly all females attempt to breed in their first year. As the majority of male Brown Treecreepers spend at least one year, and some more than four years, as non-breeding helpers on their natal territories, the mean age of first reproduction for males of this species, 2.75 years, is greater than that recorded for male White-throated Treecreepers, which is 1.83 years.

In common with many other Australian passerines, climacterids often enjoy long lives. Long-term ringing programmes have shown that White-throated and Brown Treecreepers are capable of living for at least 16 years and 13 years, respectively. Annual adult survival rates of two widely separated colour-ringed populations of Brown Treecreepers and one population of Rufous Treecreepers were very similar, at 75–78%, while those of two populations of White-throated Treecreepers, one co-existing with Red-browed Treecreepers and the other with Brown Treecreepers, were 73% and 86%, respectively. For Rufous Treecreepers, the survival rate of primary males, but not females, was positively related to group size when territory quality had been taken into account. For three species, survivorship of males, whether adult or juvenile, tended to be slightly higher than that of females. Fledgling survival to independence was 100% for White-throated Treecreepers, much higher than for Brown and Rufous Treecreepers, for which the respective values were 85% and 76%.





As is typical of Australian passerines, the *Climacteris* breeding season is long, lasting 3–5 months. This enables pairs to rear two or three broods; the **Brown Treecreeper** has been recorded making six attempts! This bird has brought a moth to the nest-hole, to feed either the female or an average of three nestlings. With such a protected nest-site, one might expect this species to have a protracted incubation period. In fact, the average duration of *Climacteris* incubation (16–18 days) is as short as Australian passerines with more vulnerable cup-nests.

[*Climacteris picumnus*  
*picumnus*,  
Horsham, W Victoria,  
Australia.

Photo: Hans & Judy Beste/  
Lochman Transparencies]

Juvenile survival rates of Brown and Rufous Treecreepers were considerably lower again, at 54% and 46%, respectively, reflecting their need to overwinter in their natal territories. Although the sex ratios of both nestlings and fledglings are not significantly biased, males invariably outnumber females in adult populations, even in those of the non-co-operative White-throated Treecreeper.

## Movements

Although the Australasian treecreepers, in common with the majority of Australian passerines, are sedentary, recent radio-tracking studies have revealed an important difference between the two genera in the dispersal of the juveniles. In the case of the White-throated Treecreeper, which is not a co-operative breeder, all juveniles of both sexes disperse soon after attaining independence, which they do 30–40 days after fledging, but for at least a further month they continue to use the natal territory as a base from which to undertake forays, moving surreptitiously so as to avoid detection from their intolerant parents. Such forays range from less than 100 m to more than 2 km, with an average of about 550 m, and last from ten minutes to several days, but juveniles of this species may eventually disperse up to 6 km in their search for breeding vacancies.

In contrast, the dispersal of juveniles of the co-operatively breeding *Climacteris* species is strongly biased towards females. Virtually all males that survive their first winter delay dispersal for at least one year and, instead, become helpers on the natal territory for up to four years. On the other hand, the majority of females, 75–77% in studied populations of Brown and Rufous Treecreepers, leave the natal territory within their first year, and, although they disperse much shorter distances, on average, than do White-throated Treecreepers, shifts of up to 7 km have been recorded. A small proportion of males inherit the natal territory, while those that find immigrant females may begin breeding in a portion of the natal territory, as with budding (see Breeding).

Breeding dispersal invariably involves moving to an adjacent or nearby territory, one where the breeding pair has divorced or one member has died. Fractal dimension analysis, which describes the degree of tortuosity of movements, revealed that the

dispersal search paths of Brown Treecreepers were more thorough than those of White-throated Treecreepers, a reflection of the tolerance of territory-owners of the former species towards dispersing individuals. Moreover, males of both species searched more tortuously than did females, possibly because males need to be thoroughly familiar with the resources of a territory in order to compete successfully for it and to attract females.

## Relationship with Man

No relevant information.

## Status and Conservation

In just over two centuries of European settlement, approximately 70–95% of various Australian temperate-woodland communities have been replaced by agriculture and pasture, remnant woodlands being used for sheep and cattle grazing. These processes have resulted in declines in the range and abundance of over 40% of the species dependent on these woodlands. While none of the Australasian treecreepers is globally threatened, populations of several *Climacteris* species are exhibiting regional declines as a result of loss and fragmentation of their woodland habitat. Consequently, several states now categorize these birds as locally threatened or vulnerable, precipitating a considerable amount of research on the causes of their declines and, in particular, on the effects of habitat fragmentation.

In north-east and central-west New South Wales, Brown Treecreepers are least abundant in small woodland patches less than 20 hectares in extent and are completely absent from remnants smaller than 9 hectares. Unlike many north-temperate species that are sensitive to habitat fragmentation, however, Brown Treecreepers in fragmented habitat are just as successful at breeding as those in unfragmented habitat, and they do not spend more time foraging. Yet a high proportion of groups, 64%, in the more fragmented habitat lacked a female for most or all of the breeding season, and could not attempt nesting, suggesting that the decline of this species in this region was due to a disruption in the dispersal of females. Indeed, when juvenile females from



unfragmented habitat were experimentally translocated to territories that lacked a female, most of these paired and formed productive groups, indicating that females are unable or reluctant to disperse through a fragmented landscape to fill breeding vacancies. Further work revealed that unconnected remnants were more likely to contain territories lacking females than were connected habitat remnants. Moreover, the survival of females was lower in unconnected remnants than in connected ones. It appears, therefore, that Brown Treecreepers are sensitive to isolation, rather than to the area of habitat, and that management of the species depends on retaining or even re-establishing links between isolated woodland remnants.

On the other side of Australia, in the more arid south-west, Rufous Treecreepers in fragmented wandoo woodlands do not appear to be suffering from a lack of females, as unpaired males are virtually absent. Instead, groups in fragmented landscapes experience lower rates of nest success, annual productivity and juvenile survival than do those in unfragmented habitat. Although no differences have been found between fragmented and unfragmented landscapes in the predation rates of artificial nests in hollows, the provisioning rates and the biomass of prey brought to nestlings were lower in the fragmented landscape, suggesting that reduced food availability was an important factor contributing to lower reproductive success. Low nest success was also related to sheep grazing, which leads to soil compaction and reduced shrub and ground cover, and these conditions, in turn, may reduce the availability of invertebrate food. In all except one of four geographically defined local populations within this landscape, studied over two years of average rainfall, fledgling productivity and recruitment were insufficient to compensate for mortality of breeding females. Calculated growth rates for the combined population in the two years of the study were, respectively, 0.69 and 0.85, well below replacement level, and much lower than the rate of 1.04–1.23 on a large, relatively undisturbed reserve of more than 12,000 hectares located 35 km away.

Without immigration from such large areas of habitat, local populations of Rufous Treecreepers within fragmented landscapes are likely to decline gradually to extinction. It has been argued, therefore, that the long-term survival of Rufous Treecreepers in agricultural regions requires the removal of non-native grazing

mammals from habitat remnants, and the cessation of other disturbances, such as the removal of dead wood. Paradoxically, current conservation efforts to exclude grazing from woodland remnants in eastern Australia appear to be contributing to further decline of the Brown Treecreeper, because, in the absence of fire, ungrazed remnants rapidly develop a dense shrub layer and grassy ground cover, which reduce foraging opportunities. Indeed, this species has disappeared from fenced reserves, and is more abundant in state forests and private woodland remnants than in national parks where grazing has been prohibited for decades. This example illustrates the importance of considering the ecological requirements of all, rather than a few, declining species when formulating habitat management strategies.

Perhaps the climacterid most at risk is the patchily distributed White-browed Treecreeper, which is adapted to arid conditions. In south-eastern Australia, over 90% of the *belah* (*Casuarina pauper*) woodlands favoured by this species in north-west Victoria were selectively cleared in the twentieth century, and only a handful of tracts of more than 500 hectares now remain. In this landscape, White-browed Treecreepers are not found in remnants with less than 18.5 hectares of *belah* woodland, although, above this threshold, their density is not correlated with the size of the remnant. In this case, the degree of isolation of remnants and the existence of corridors linking them do not reliably predict the presence of the species. Nevertheless, the persistence of the White-browed Treecreeper in remnants of 20 hectares or more, entirely surrounded by agricultural land, suggests that it is capable of crossing up to 450 km of cultivated land by using the extensive network of "linear" vegetation along roadsides and fence-lines, as well as scattered smaller remnants. The enlarging of existing woodland remnants, the creation of new habitat and the maintaining of landscape connectivity are priorities for the long-term conservation of this species.

Ironically, the species that appears to be least affected by habitat fragmentation in Australia is the only one with an affinity for rainforests. The White-throated Treecreeper remains common in fragmented landscapes, doubtless facilitated by its unusually broad choice of habitats, which range from upland tropical rainforest and exotic pine plantations to the same grazed woodlands as are occupied by Brown Treecreepers. It seems very likely that the ecological flexibility of the White-throated Treecreeper and its lack of sensitivity to fragmentation relate to its unique social organization (see General Habits). Could intolerance towards its own offspring have predisposed the species to the colonizing of fragmented and even novel habitats? There can be little doubt that both delayed dispersal and delayed breeding by *Climacteris* treecreepers are handicaps for populations occupying fragmented landscapes. The requirements of most of these species for open spaces in which to forage, unimpeded by dense ground cover, as well as for tree hollows in which to roost and take refuge from predators, confer further limitations that are lacking in the case of the White-throated Treecreeper. In a part of the world where the economic desires of farmers still largely dictate the management of lands that are marginally productive, the tolerant co-operative lifestyle typical of many Australian species that evolved in the country's fire-prone but relatively benign climate may yet prove to be their downfall.

#### General Bibliography

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This female White-throated Treecreeper—sexed by her rusty cheek spot—has probably just brought food to the well-grown nestling, which can be aged by its pale gape line. Female climacterids play the major role in the breeding process. In most members of the family, females build the nest and incubate alone. In exchange, the male feeds the female, mainly away from the nest. Both parents feed the young, as do the helpers in the case of co-operatively breeding *Climacteris*. After fledging, feeding rates decrease gradually until the young become independent 30–40 days after leaving the nest.



[*Cormobates leucophaea*,  
E Australia.  
Photo: ANT/NHPA]



♂ *ssp leucophaca*

♀

inches 3  
1 2 3 4 5 6 7 8

PLATE 51

1

*ssp minor*

♂

♂

2

♀

♀

*ssp picumnus*

♂

5

*ssp melanotus*

♂

3

♀

4

♂

♂

*ssp melanurus*

♀

7

6

♀

♂

*ssp wellsi*



# Genus *CORMOBATES* Mathews, 1922

## 1. White-throated Treecreeper

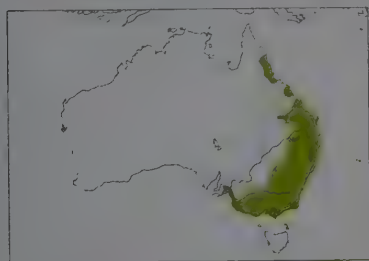
### *Cormobates leucophaea*

French: Échelet leucophaea German: Weißkehl-Baumrutscher Spanish: Corretroncos Gorjiblanco  
Other common names: Little Treecreeper (*minor*)

**Taxonomy.** *Certhia leucophaea* Latham, 1801, Sydney, New South Wales, Australia. Genus previously merged into *Climacteris*, but differs in structure (bill shape, leg length, sole pads, skull, secondaries), egg coloration, plumage (juvenile characteristics, sexual dimorphism) and behaviour; generic separation corroborated by molecular evidence. Genus name originally combined with feminine adjectives, so deemed to be feminine. Forms a superspecies with *C. placens*, and has in the past been treated as conspecific. Race *minor* has in the past been treated as a separate species, but birds intermediate between it and nominate race occur in SE Queensland. Five subspecies recognized.

#### Subspecies and Distribution.

- C. l. minor* (E. P. Ramsay, 1891) – highlands of NE Queensland, in NE Australia.
- C. l. intermedia* (Boles & Longmore, 1984) – highlands of CE Queensland.
- C. l. metastasis* Schodde, 1989 – SE Queensland and NE New South Wales.
- C. l. leucophaea* (Latham, 1801) – coast, highlands and W slopes (upper watersheds of Murray-Darling Basin) of SE Australia, from CE New South Wales S to SE South Australia.
- C. l. griseus* (Mathews, 1912) – Mt Lofty Ranges, in SE South Australia.



**Descriptive notes.** 14–16.5 cm; 17 g (*minor*) to 22 g (nominate). Male nominate race is dark brown above, with thin whitish loreal streak, fine grey scaling on forehead, thin whitish broken eyering; contrasting grey rump and tail, latter with black subterminal band; wing with broad contrasting rufous-buff bar across bases of remiges; throat white, merging into yellowish-white on central lower breast and belly; breast side and flanks grey-brown with bold, black-fringed cream-white streaks, undertail-coverts creamy-white with broken black bars; iris dark brown; bill black to grey-black, usually with pale grey or cream basal half of lower

mandible; legs dark grey to black. Female differs from male in having rusty-orange spot on cheek. Juvenile differs in having blackish-edged dull white shaft streaks on scapulars, often fine grey scaling on upper breast, strong cinnamon-brown wash on undertail-coverts and sometimes abdomen, also yellowish cutting edge and base of lower mandible, cream gape, dark olive-brown legs and feet (with soles and rear of tibiotarsal joint yellow); in addition, young female has rump and uppertail-coverts orange-chestnut. Races vary mainly in plumage and in size: *minor* is smaller and darker than others, with little contrast between back and olive-grey rump and tail, greyish-white of throat merging with olive-grey breastband, creamy-buff belly heavily mottled olive-brown and dark grey; *intermedia* is intermediate in size and coloration between previous and nominate; *metastasis* is slightly smaller than nominate, both sexes like nominate male but breast brownish-grey; *griseus* is largest and paler below than nominate. **VOICE.** Typical territorial call (both sexes) a series of penetrating piping notes, repeated rapidly, then slowing and falling slightly, continuing for up to 5 minutes; notes also given singly for contact. Male also gives repeated series of up to 10 upward-inflected notes with slight crescendo, and rippling mellow trill. Female occasionally gives succession of descending and slowing notes; during incubation period, soft notes (like Morse code). Juvenile has distinctive soft trill.

**Habitat.** Wide variety of wooded habitats, including tropical and subtropical rainforest, cool temperate forest dominated by southern beech (*Nothofagus*), wet and dry sclerophyll forests dominated by eucalypts (*Eucalyptus*, such as stringybarks, boxes, peppermints or ashes, and smooth-barked gums) and with shrubby understorey, also riparian woodlands of river she-oak (*Casuarina*) or river red gum (*Eucalyptus camaldulensis*), and inland woodlands of cypress pine (*Callitris*) and brigalow (*Acacia harpophylla*). Survives in small isolated forest or woodland remnants, and in selectively logged areas, but rare or absent in clear-felled or heavily cattle-grazed areas. Lowlands to lower highlands; race *minor* at 300–1200 m in highlands of NE Queensland.

**Food and Feeding.** Adult and larval insects, mainly ants (Formicidae); also spiders (Araneae); occasionally sap from acacias or eucalypts, and rarely nectar. Of 4446 items in stomachs of specimens from NE New South Wales, ants accounted for 92% (49% of biomass) and beetles (Coleoptera) 3% (32% of biomass), remainder mainly bugs (Hemiptera), flies (Diptera), wasps (Hymenoptera), moths (Lepidoptera) and spiders, with smaller numbers of cockroaches (Blattodea), grasshoppers (Orthoptera), lacewings (Neuroptera), termites (Isoptera) and pseudoscorpions (Pseudoscorpiones); ants included six genera, and beetles ten families. Items identified by direct observations at two sites (respective totals of 47 and 26) included spiders (7–20%), insect larvae (32–65%) and adult beetles (0–32%). Forages on bark of trees and shrubs, as well as logs, but rarely on ground; foraging heights depend on heights of available vegetation, mostly on tree trunks (up to 88% in five studies) and branches, as well as twigs (usually less than 4%); males foraged at higher level than females in two studies (in NE & SE New South Wales). In dry sclerophyll forest, prefers rough-barked eucalypts such as stringybarks (45–72% of observations at three sites in NE New South Wales) and ironbarks (36% where present), spending less time on eucalypts with predominantly smooth bark; at one site, females spent more time in stringybarks and less time on dead branches than males, but no such differences found at other study sites. Foraging technique mostly gleaning (up to 82% of observations), but also probing (up to 18%), and hammering and pulling bark (up to 4%); occasionally sallies for aerial insects and probes in flowers.

**Breeding.** Season Aug/Sept–Dec/Jan; normally single-brooded. Socially monogamous, normally breeding as pair; individual (of either sex) occasionally maintains pair-bonds simultaneously with two of opposite sex. Nest built by female alone, taking 7–15 days, cup-shaped structure composed of bark fibres, grass and moss, lined with finer bark, fur and feathers, placed inside tree hollow,

with entrance through hole in trunk, or crack in side of limb or end of broken limb (often dead one), sometimes in nestbox; of 67 nest-sites over entire range, 40% in trunk or stump, 36% in branch or broken limb (“spout”) and 24% in nestbox, and of 44 nests in NE New South Wales 70% in trunk and 30% in branch; height of 83 nests over whole range 1–25 m (mean 7 m), and of 25 nests in NE New South Wales 4–13 m (mean 5.5 m); in one study six of 20 nests were used in two consecutive seasons, and in another study only four of 73 sites were used twice; territory 2–12 ha, varying with habitat quality, in C New South Wales (22 pairs) 3–7 ha (mean 6 ha), in NE New South Wales means at two sites 3.9 ha and 5.8 ha (nine and five pairs, respectively). Clutch 2–3 eggs, rarely 4 (mean of 20 clutches over entire range 2.45), dull white with a few rounded spots and dots of dark reddish-brown to purplish-black, mainly at larger end; laying starts c. 10–20 days after nest completed, eggs laid on alternate days (probably at intervals of 40–48 hours); incubation from last or penultimate egg, by female only, fed by male both at nest (1.4–1.9 times per hour) and off nest (17 times per hour for one pair); female attentiveness c. 74%; in two studies, mean stints on nest respectively 24 and 27 minutes and mean absences 10 and 12 minutes; duration of incubation period 22–23 days; young brooded by female for at least 14 days, fed by both parents (male often passes food to brooding female), 9–18 feeds per hour, nestling period 24–26 days; juveniles dependent for c. 35 days, remain in natal territory for up to 75 days post-fledging. Can breed in first year. Maximum recorded longevity 16 years; adult annual survival in NE New South Wales 73% (as low as 21% during drought), in CW New South Wales 87% for males and 83% for females; juvenile survival to independence 100%.

**Movements.** Sedentary. In radio-tracking study, juveniles of both sexes made forays ranging from less than 100 m to more than 2 km in search of breeding positions, eventually dispersing up to 6 km (females farther than males). Of 954 recoveries of ringed individuals, all less than 10 km from ringing site.

**Status and Conservation.** Not globally threatened. Common. Population densities in different parts of New South Wales, 0.1–1.13 birds/ha (0.32/ha in detailed study) in NE, 0.9 birds/ha in CE, and 0.6–0.8 birds/ha in SE; in Victoria 0.2–1.12 birds/ha. Less abundant in burnt than in unburnt open eucalypt forest one year after fire. Able to survive in small woodland remnants and in clear-felled forest where some old trees retained; in tropical rainforest, more abundant in selectively logged areas than in regrowth. Occurs in several protected areas, e.g. Eungella National Park (SE Queensland).

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Boles & Longmore (1983), David & Gosselin (2002b), Dickson (1933), Doerr, E.D. (2005), Doerr, E.D. & Doerr (2002, 2005, 2006), Doerr, V.A.J. & Doerr (2004), Doerr, V.A.J. *et al.* (2006), Higgins *et al.* (2001), McCarthy (2006), Noske (1979, 1982, 1984, 1985c, 1986, 1991b), Pizzey *et al.* (2005), Schodde (1989), Schodde & Mason (1999), Simpson *et al.* (2004).

## 2. Papuan Treecreeper

### *Cormobates placens*

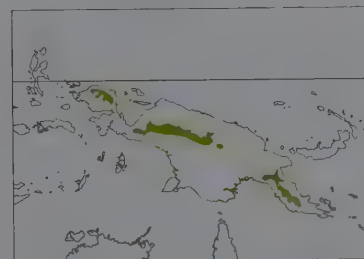
French: Échelet papou German: Papuabaumrutscher Spanish: Corretroncos Papú  
Other common names: New Guinea Treecreeper

**Taxonomy.** *Climacteris placens* P. L. Slater, 1874, Hatam, Arfak Mountains, New Guinea.

Genus previously merged into *Climacteris*, but differs in structure (bill shape, leg length, sole pads, skull, secondaries), egg coloration, plumage (juvenile characteristics, sexual dimorphism) and behaviour; generic separation corroborated by molecular evidence. Genus name originally combined with feminine adjectives, so deemed to be feminine. Forms a superspecies with *C. leucophaea*, and has in the past been treated as conspecific. There has been no recent taxonomic revision of this species, and distributional limits are uncertain. Four subspecies traditionally recognized.

#### Subspecies and Distribution.

- C. p. placens* (P. L. Slater, 1874) – Vogelkop (Tamrau Mts, Arfak Mts), in NW New Guinea.
- C. p. steini* (Mayr, 1936) – W & C New Guinea from Weyland Mts E east through Hindenburg Range to Tari Gap area.
- C. p. inexpectata* (Rand, 1940) – Snow Mts, in WC New Guinea.
- C. p. meridionalis* (E. J. O. Hartert, 1907) – mountains of SE New Guinea (E from Aseki area, Mt Kaindi and Herzog Mts).



**Descriptive notes.** 14.5 cm; 12–19.5 g. Male nominate race has dark brown crown with ill-defined pale buff streaks; hindneck to rump and tertials dull brownish-olive, uppertail-coverts as mantle or greyer; upwings darker than mantle, with rufous-buff bar across remiges, and with secondaries and inner primaries broadly tipped pale brown; tail olive to grey with blackish subterminal spot, outer feathers dark olive to brownish-black with broad pale grey or buff tips; throat whitish, merging into buffy grey on upper breast, more ochraceous on belly, flanks dark brownish-grey with buff streaking, lower abdomen spotted buff, undertail-coverts barred dark brown to black; iris blood-red to red-brown; bill black to greyish-black, basal half of lower mandible whitish; legs greyish-yellow to olive. Female differs from male in having conspicuous rusty-orange cheek patch, throat light buffy grey, lower abdomen with larger, black-bordered ochraceous-buff streaks. Immature resembles adult; young female differs from adult female in having abdomen heavily mottled with ochraceous buff and black. Races differ mainly in plumage: *steini* is similar to nominate, but more dark greyish-olive above; *inexpectata* resembles previous, but forehead streaks more sharply defined, rump and uppertail-coverts pure grey, tail greyer, underparts paler; *meridionalis* is browner above than last, more strongly ochraceous on belly. **VOICE.** A mellow series of 5–10 flute-like or bell-like notes, slowly ascending in pitch, with final note sustained; a gradually descending trill similar to that of Chestnut-breasted Cuckoo (*Cacomantis castaneiventris*); and a faint nasal triplet, “chu chee chu”.

**Habitat.** Lower to upper montane rainforest, from 1250 m to 2600 m; also subalpine forest at up to 3000 m in Snow Mts (race *inexpectata*).

**Food and Feeding.** Insectivorous, but no details. Forages mostly in middle to upper levels, but sometimes close to the ground. Climbs jerkily up and around tree trunks, then swoops down to lower level, whereupon it immediately starts climbing again. Usually seen singly, but occasionally in pairs and family parties.



**Breeding.** No information.

**Movements.** Presumably sedentary.

**Status and Conservation.** Not globally threatened. Rarely seen, but reckoned probably to be locally common. As logging and slash-and-burn agriculture are concentrated in the lowlands, the species would appear to be secure in its more elevated habitat. Ecology and biology poorly known; research required.

**Bibliography.** Beechler *et al.* (1986), Coates (1990), David & Gosselin (2002b), Diamond (1972), Gilliard & LeCroy (1961a), Hartert *et al.* (1936), Iredale (1956), Mayr & Rand (1937), Rand (1940a), Rand & Gilliard (1967).

## Genus *CLIMACTERIS* Temminck, 1820

### 3. Red-browed Treecreeper

#### *Climacteris erythrops*

**French:** Échelet à sourcils roux

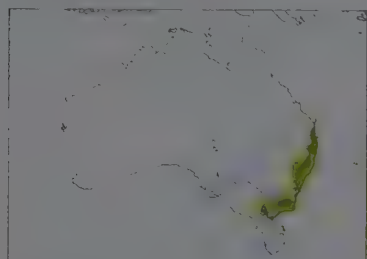
**German:** Rostbrauen-Baumrutscher

**Spanish:** Corretroncos Cejirrojo

**Other common names:** Red-eyebrowed Treecreeper

**Taxonomy.** *Climacteris erythrops* Gould, 1841, Liverpool Ranges, New South Wales, Australia. Genus name originally introduced with no indication of intended gender, so deemed to be masculine by default. Forms a superspecies with *C. affinis*. Birds from mountain forests of SE coast of Victoria described as race *olinda*, but generally considered indistinguishable from populations in rest of range. Monotypic.

**Distribution.** Coastal and highland forests of SE Australia, from SE Queensland S to Victoria (E from slightly W of Melbourne).



**Descriptive notes.** 15–16 cm; 23 g. Male has dark grey head, neck, rump and uppertail-coverts, contrasting with dark brown rest of upperparts; broad eyebrow, lores and area below eye rusty-orange; upperwing blackish-brown, grey tertials and contrasting pale grey-buff bar across base of remiges; uppertail grey, broad black subterminal band on all except central rectrices; throat dull white; upper breast brownish-grey, lower breast and flanks dark brownish-grey with bold black-fringed white stripes, belly cream with dark spots, undertail-coverts buff-white with broken black bars; iris dark brown; bill and legs black. Female differs from male in having eyebrow, lores and area below eye dark reddish-chestnut, and upper breast striped chestnut and dull white. Juvenile has uniform grey head, lacking rufous eye patch of adult, and few or no markings on underparts, also bill mostly cream, legs flesh-grey. Voice. Typical call a rapid slightly descending chatter with buzz-like quality, often immediately answered by sharp disyllabic call in which second note lower in pitch than first; infrequent calls include a harsh low-pitched grating note, used during aggression, and a high-pitched upward-inflected note, quickly repeated up to four times.

**Habitat.** Open forests and woodlands of Great Dividing Range, as well as coastal and inland slopes; sea-level to c. 1500 m. Commonest in wet sclerophyll forest dominated by eucalypts (*Eucalyptus*) and with well-developed shrubby understorey in gulleys of foothills, but common also in dry sclerophyll forest with grassy understorey on ridges. Prefers forests that support smooth-barked eucalypts (such as Sydney blue gum, flooded gum and mountain gum) as dominants or co-dominants with rough-barked eucalypts. Presence in subtropical or temperate rainforests linked to that of emergent eucalypts.

**Food and Feeding.** Adult and larval insects, mainly ants (Formicidae); also spiders (Araneae). Of 4038 items in stomachs of specimens from NE New South Wales, ants accounted for 87% and beetles (Coleoptera) 5%; remainder mainly spiders, bugs (Hemiptera), flies (Diptera), wasps (Hymenoptera) and moths (Lepidoptera), with smaller numbers of cockroaches (Blattodea), grasshoppers (Orthoptera), lacewings (Neuroptera), termites (Isoptera) and pseudoscorpions (Pseudoscorpiones). Of 47 items identified by direct observations at one site, 63% were insect larvae and 20% spiders. Forages mostly on tree trunks, branches and twigs, and occasionally on logs or on ground (1% in two studies), and at all heights; in New South Wales, 21% of foraging time spent below 6 m in NE and 44% of observations below 4 m in SE, and in both regions females spent more time at upper levels than did males. In NE New South Wales, foraged in boxes (with scaly bark on trunk and patches of loose peeling bark on otherwise smooth branches) more often and in stringybarks (with persistent fibrous, often corrugated bark) less often than did co-existing *Cormobates leucophaea*; females stayed longer in each tree (in both boxes and stringybarks) and foraged in rough-barked boxes more often than did males. Foraging on trunks and large boughs 42–58% in NE New South Wales, these substrates used by males more than by females, while females favoured branches and twigs with strips of peeling bark; in SE New South Wales, pattern was reversed. Foraging technique mainly gleaning (62–80%), but also probing (19–31%) beneath sheets of peeling bark on limbs, and inside cylinders of shed bark on twigs; occasionally pulls and hammers bark (4% and 3%, respectively, in SE New South Wales).

**Breeding.** Season late Aug to Jan; sometimes two broods (two of six groups in sole detailed study, in NE New South Wales). Socially monogamous, but no genetic studies of offspring to show extent of extra-pair matings. Breeds as pair, or as co-operative group consisting of one breeder of each sex and one or two helpers, usually male; of 20 breeding unit-years in sole study, 35% were unassisted pairs, and remainder contained one male helper (45%), two male helpers (15%) or one female helper (5%). Nest built mainly by female, male assisting with addition of lining; cup-shaped, composed of bark fibres and dried grass, lined with fur or feathers, placed at bottom of tree hollow, with entrance through hole in trunk, or crack on side of limb or open end of broken limb ("spout"), often dead; of 29 nests at one locality, 83% in spout and 17% in trunk or bough (62% in live tree, 38% in dead tree); 18 nests over entire range 2.5–30 m (mean 14.5 m) above ground, and 27 nests in NE New South Wales 5–20 m (mean 10.6 m) up; of 21 sites in sole detailed study, five used in two or more consecutive seasons; territory stable from year to year, size 8–20 ha. Clutch 2 eggs, lustrous, pale pinkish-white, thickly freckled with purplish-red and violet-grey, especially at thicker end; incubation by breeding female only, fed both at and off nest by breeding male and any helpers present, in one study helpers provided female with 31% of

feedings; incubation period 18 days; chicks fed by both parents, and by helpers if present; in one study, rate of 10 feeds per hour, 32% by breeding female, 42% by breeding male and 26% by helpers; nestling period 25 days; juveniles dependent for at least 60 days after leaving nest, and one record of juvenile fed by adult 80 days after fledging. Of 22 fledglings, 41% dispersed or died within two months of fledging and six (22%) of remainder survived into following winter; mean annual adult survival 79%.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Moderately common in suitable habitat. Absence from isolated patches of forest in NE New South Wales suggests vulnerability to clearance and habitat fragmentation, although has been recorded in forest patches as small as 12 ha. Absent from pine (*Pinus*) plantations despite presence in adjacent eucalypt forests.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Friend (1982), Higgins *et al.* (2001), Loyn (1985b), Noske (1979, 1984, 1985c, 1986, 1991b), Pizzey *et al.* (2005), Recher & Holmes (2000), Recher *et al.* (1985), Schodde & Mason (1999), Simpson *et al.* (2004), Smith (1985).

### 4. White-browed Treecreeper

#### *Climacteris affinis*

**French:** Échelet à sourcils blancs

**German:** Weißbrauen-Baumrutscher

**Spanish:** Corretroncos Cejiblanco

**Other common names:** White-eyebrowed Treecreeper

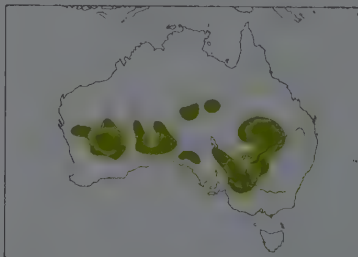
**Taxonomy.** *Climacteris affinis* Blyth, 1863, Broken Hill, New South Wales, Australia.

Genus name originally introduced with no indication of intended gender, so deemed to be masculine by default. Forms a superspecies with *C. erythrops*. Races intergrade in South Australia (Flinders Ranges). Two subspecies recognized.

**Subspecies and Distribution.**

*C. a. superciliosus* North, 1895 – arid S Western Australia E to ranges of C Australia, and E South Australia (W edge of Flinders Ranges).

*C. a. affinis* Blyth, 1863 – SW Queensland, W New South Wales, NW Victoria and SE South Australia.



**Descriptive notes.** 14–16 cm; 21 g. Male nominate race has broad white eyebrow contrasting with black lores, tapering above ear-coverts, which are streaked black and white; crown and hindneck dark grey, grading into brown on mantle and scapulars; rump, uppertail-coverts and uppertail grey, black subterminal tailband; upperwing blackish-brown, grey tertials, broad buff bar across middle of remiges; chin white, grading to pale brownish-grey on throat and upper breast, with lower breast, belly, vent and flanks boldly striped black and white; undertail-coverts white with broken black bars; iris dark brown; bill and legs black. Female differs from male in having eyebrow bordered above by thin reddish-brown line, and centre of upper breast striped reddish-brown and dull white. Juvenile has duller facial pattern, with supercilium and streaking on ear-coverts less distinct, also bill pale grey, with pinkish-grey at base of lower mandible, gape white; young female has rufous markings on supercilium and upper breast less distinct than on adult. Race *superciliosus* differs from nominate in having rump, uppertail-coverts and tail same colour as mantle (not grey). Voice. Main call a ringing insect-like trill, sometimes described as "rasping call"; also a louder whistle, "tinker-tinker-tinker". Calls not well understood, as given infrequently.

**Habitat.** Tall shrublands and low woodlands of arid and semi-arid regions, usually dominated by acacias (*Acacia*), such as mulga, gidgee and western myall, or by belah (*Casuarina pauper*), buloke (*Allocasuarina leucomammii*) or native cypress pine (*Callitris*); less often in mallee or sugarwood (*Myoporum*) shrublands and riverine woodland. Understorey may be open or grassy, e.g. spinifex (*Triodia*), or shrubby (often dominated by species of the Chenopodiaceae).

**Food and Feeding.** No detailed studies. Food mainly ants (Formicidae), but also small numbers of spiders (Araneae), beetles (Coleoptera), moths (Lepidoptera), flies (Diptera), termites (Isoptera), and various insect larvae. Arboreal and terrestrial. Ascends trunks and branches of both living and dead trees, and hops along fallen trees, among logs and litter, and on bare ground, particularly where abundant shrubs; sometimes feeds at ant nests.

**Breeding.** Season Jul (Western Australia) or late Aug (Victoria) to late Nov, but timing differs from one year to another; majority attempt second brood in years with good rainfall. Breeds as pair, or co-operatively in group consisting of one breeder of each sex and up to three helpers, invariably males; in sole detailed study (in NW Victoria), 65% of 26 breeding unit-years involved unassisted pairs, and remaining pairs had one helper (31%) or three helpers (4%). Both parents and helper males brought material to nest, continuing during incubation; nest composed mainly of bark fibres and dried grass, lined with fur, hair, wool, feathers or vegetable down (some nests entirely of fur or wool), placed in tree hollow (depth of 13 hollows 8–42 cm, mean 17.4 cm), often in dead tree or dead limb of live one, with entrance through hole or split in trunk or in open end of broken limb; of 17 nests at one locality, 82% in live (versus dead) tree and 71% in belah, and 85% of 13 nests were in trunk (as opposed to limb); 20 nests over entire range 1.1–5 m (mean 2.3 m) above ground, and 17 nests in NW Victoria 2–5.2 m (mean 3 m) up; territory all-purpose, permanent, 6–6.11.2 ha (mean 8.4 ha), size not correlated with group size. Clutch 1–3 eggs, usually 2 (mean of 38 clutches in NW Victoria 1.95, of 13 in Western Australia 1.85), slightly lustrous, pinkish-white, thickly freckled and spotted with reddish and purplish-brown, especially at thicker end; incubation by breeding female only, fed (usually at nest entrance) by male and helpers, female's attentiveness varied, females in pairs incubated for 45% of time during first 10 days and 58% thereafter, those in groups for 58–59% of time over entire period; incubation period 18 days; chicks brooded by female for at least 7 days after hatching, for average of 53% of time in four pairs, fed by both parents and any helpers, in one study 7.3 feeds per hour; in first week, hourly feeding rate among pairs (4.75 feeds) lower than among groups (6 feeds), but by third and fourth weeks pattern reversed (10.1 and 7.7 feeds, respectively); also during first week, female provided 37% of food when in pairs (1.75 feeds per hour) and 17% of food in groups (1 feed/hour), but by third week provided 47% (4.8 feeds/hour) in pairs and 31% (2.4 feeds/hour) in groups; proportion and rate of feeding by female higher for pairs (43%, 3.2 feeds/hour) than for groups (31%, 2.2 feeds), and for groups helpers provided 26% of food overall (1.8 feeds/hour); nestling period 26 days; dependent for less than 37 days after fledging. Mean annual adult survival of a population in NW Victoria 72–85%, higher for males (75–87%) than for females (69–84%).

**Movements.** Sedentary.



**Status and Conservation.** Not globally threatened. Relatively uncommon. Considered vulnerable in Victoria, where its range has contracted due to selective clearing of its preferred habitats of belah and buloke woodland, which now cover only 10% of their original extent in this region. Not found in belah woodland remnants of under 19 ha, and less common on sites grazed by livestock.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), David & Gosselin (2002b), Higgins *et al.* (2001), Houghton (1998), Macdonald (1969a), McCarthy (2006), McCulloch & Saunders (1999), Noske (1980b), Pizzey *et al.* (2005), Radford (2004), Radford & Bennett (2004, 2006), Schodde (1993), Schodde & Mason (1999), Simpson (1997), Simpson *et al.* (2004).

## 5. Brown Treecreeper

### *Climacteris picumnus*

**French:** Échelet brun **German:** Braunbaumrutscher **Spanish:** Corretroncos Pardo  
**Other common names:** Black/Black-backed Treecreeper (*melanotus*)

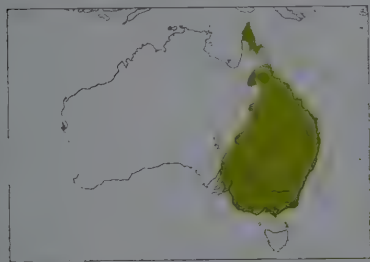
**Taxonomy.** *Climacteris picumnus* Temminck, 1824, southern Queensland, Australia.

Genus name originally introduced with no indication of intended gender, so deemed to be masculine by default. Forms a superspecies with *C. rufus* and *C. melanotus*. Races intergrade. Race *melanotus* has been considered a separate species, but specimens intermediate in colour and size between it and nominate occur. Three subspecies recognized.

#### Subspecies and Distribution.

*C. p. melanotus* Gould, 1847 – N Queensland (from Cape York S to R Burdekin), in NE Australia.  
*C. p. picumnus* Temminck, 1824 – C & E Queensland (from lower R Burdekin) S to SE South Australia.

*C. p. victoriana* Mathews, 1912 – E seaboard and Great Dividing Range from SE Queensland (Bunya Mts) S to coastal W Victoria (The Grampians).



**Descriptive notes.** 14–18 cm; 22–44 g. Male nominate race has brownish-grey crown and neck, blackish-grey lores and eyestripe, broad creamy supercilium, indistinct narrow whitish broken eyering, and buff ear-coverts streaked dark grey posteriorly; upperparts, including upwringing-coverts and tail, mid-brown, with broad black subterminal tailband; flight-feathers blackish-brown, broad pale buff diagonal bar across middle; cheek, chin and throat whitish to greyish-cream; breast light brownish-grey with small central patch of black and white streaks, lower breast, belly and flanks buff-brown with finely black-edged white

stripes, undertail-coverts buffy white with broken black bars; iris dark brown; bill and legs greyish-black. Female is like male, but with streaks on breast chestnut and white. Juvenile differs from adult in having head darker and greyer, with indistinct pale grey supercilium, upperparts slightly darker and browner, markings on breast centre smaller (male) or hidden (female), streaking on lower underparts off-white and bordered with black spots (rather than lines), flanks, vent and undertail-coverts washed rufous-brown; bill dark grey with whitish cutting edges and gape, legs flesh-grey. Race *victoriana* is larger than nominate, with head markings duller and less distinct, upperparts browner, cheek, chin and throat often washed rufous, breast with faint pinky wash; *melanotus* is smaller than others, has upperparts uniform blackish-brown, and pale creamy-white bold supercilium, anterior ear-coverts, cheek, chin and throat contrasting with brownish-black crown, eyestripe and posterior ear-coverts. Voice. Main call a slightly upward-inflected staccato “pink”, singly or repeated slowly 5–10 times on descending scale, sometimes accelerating and culminating in melodious whistles or cackles; also a series of 4–100 weaker monotonal notes with slight crescendo; harsh rasping rattle (usually in alarm); less frequently heard food-begging “ding” call, wails and chirps. Both sexes call, sometimes simultaneously, apparently duetting.

**Habitat.** Mostly woodlands dominated by eucalypts (*Eucalyptus*), especially rough-barked species such as stringybarks or boxes, usually with open grassy understorey and poorly developed shrub layer, and often with dead trees, abundant fallen timber or both. Also in open eucalypt (dry sclerophyll) forests comprising ironbarks or boxes or gums; found also in mallee woodland or shrubland, in river red gums (*Eucalyptus camaldulensis*) or river she-oaks (*Casuarina*) along creeks, in cypress pine (*Callitris*), in acacia (*Acacia*) open woodland (e.g. gidgee) and in semi-cleared pastures. Occurs in both unburnt and annually burnt habitats.

**Food and Feeding.** Adult and larval insects, mainly ants (Formicidae); also spiders (Araneae); also occasionally takes nectar and sap from eucalypts. Of 3339 items in stomachs of specimens from NE New South Wales, ants represented c. 75% and larvae c. 20%; remainder mainly beetles (Coleoptera, of at least eight families), spiders, bugs (Hemiptera), flies (Diptera), wasps (Hymenoptera), grasshoppers (Orthoptera) and moths (Lepidoptera). At least nine genera of ants eaten; of 3303 ants from 22 specimens in one region, 63% were of genus *Iridomyrmex* and 6.5% *Crematogaster*. In 51 direct observations of feeding, larvae comprised 80% of prey and beetles 10%, but no ants recorded. Forages in trees and on ground in approximately equal proportions. At two sites in NE New South Wales, foraged on the ground or on logs 37–49% of time, on tree trunks c. 30–40% and on branches c. 10–20%; ground-foraging more frequent in winter and spring. At other sites in same region, 65% of foraging time spent on ground, 8% on logs, stumps and dead trees, and remainder on live trees (74–79% of time on trunk, 16–19% on boughs, and 5–7% on smaller branches). Prefers lower levels of trees, in one study spending 45% of time below 1 m and 25% at 1–2 m. Prefers rough-barked trees, such as stringybarks (at two sites, 34–55% of trees visited) and ironbarks or rough-barked species of box (28–30%), and less partial towards half-smooth boxes (10–16%), smooth-barked gums (5–6%) and dead trees (16%). Usually flies to base of tree, but sometimes climbs directly on to trunk from ground. Main foraging technique gleaning (more than 90%), but also probes bark strips and crevices; occasional aerial sallying, pouncing and flower-probing. No detected differences between sexes in foraging behaviour.

**Breeding.** Season mid-Jul to early Dec; up to six nesting attempts per season, but usually only one brood (rarely two) successfully reared. Breeds as pair, or as co-operative group consisting of primary (breeding) pair and up to six helpers (mostly males) per nest; helpers are mostly offspring from previous breeding seasons (intra-group helpers), but often also include breeding males and females, and non-breeding males, from adjacent territories (extra-group helpers). Nest-building mainly by breeding female, but breeding male and helpers bring lining material, even after clutch complete; nest a thickly woven cup of grass, bark, leaves, and occasionally human refuse such as aluminium foil, sometimes built on top of platform up to 40 cm deep consisting of grass, dung, charcoal and snake scales, nest lined with fur, wool, feathers, thistle-down and/or snakeskin; usually placed in tree hollow, usually eucalypt, with entrance through hole in trunk or crack in side of limb, or open end of broken limb (“spout”), often dead one; of 41 nests at one site in NE New South

Wales, 85% in dead tree or stump, 10% in dead spout of living tree and 5% in hole in living tree (63% were in vertical hollow, rest inclined or horizontal), and eight sites were reused in consecutive or subsequent years; artificial sites (e.g. hollow fence posts, nestboxes, chimneys, ventilation pipes, even old kettle) also used; nest-entrance diameter 6–13 cm, depth of hollow 20–260 cm (mean 59.3 cm); height above ground of 112 nests from different parts of range 0.3–25 m (mean 4 m), and of a further 41 nests in NE New South Wales 1.2–12.2 m (mean 4.9 m); territory permanent, in New South Wales 1.5–4.5 ha (average 3.4 ha) in CW region and 6.8–20 ha (correlated with size of group) in NE, boundaries shifting only after disappearance of one or both members of breeding pair, or when non-breeding male establishes own breeding territory on a portion of his natal territory (known as “budding”); “super-territories” comprise up to six adjacent territories, among which group-members may move and help at several nests. Clutch 2–4 eggs, usually 3 (mean of 37 clutches throughout range 2.65, of 33 in NE New South Wales 2.82), smooth and slightly lustrous, pinkish-white ground almost obscured by freckles and mottling of purplish-red and reddish-brown (sometimes bigger and more numerous at larger end), with a few underlying violet-grey spots; laying interval normally 24 hours, but two instances of third egg laid at least 42 hours after second; incubation by female only, fed on nest by breeding male and by any helpers present, female attentiveness 57–63%, mean duration of incubation bouts in NE & CW New South Wales 12 and 17 minutes, respectively, and breaks 7 and 9 minutes; incubation period 15–16 days; chicks brooded by female (male continues to feed her for few days after young hatch), fed by both parents and by any helpers in group, 14.7 feeding visits per hour (50 nests, CW New South Wales); contribution of helpers often equal to that of primary pair but up to 60% (varies with number in group); nestling period 21–26 days; juveniles dependent for c. 30–40 days after fledging; female capable of laying complete second clutch within 14 days after first brood fledges, and she will feed nestlings of second brood; most males (95%) that survive first winter delay dispersal from natal territory for at least one year, while majority (75%) of such females leave to search for breeding positions. Able to breed in first year. Maximum recorded longevity 13 years 11 months post-ringing; in South Australia, 10% of individuals recovered at least 6 years old; annual adult survival 76–78% in two studies (NE & CW New South Wales) and juvenile survival (to dispersal stage) 50% and 54%, respectively.

**Movements.** Sedentary. Of 752 recoveries of ringed individuals, all were less than 10 km from site of ringing.

**Status and Conservation.** Not globally threatened. Locally common. N populations of race *melanotus* in far N Queensland have declined, and their range contracted since at least 1930s, probably as a result of increased severity of fires; these trends may date back to start of European occupation. Densities in S vary from 0.01–0.27 birds/ha (NE New South Wales) to 0.42 birds/ha (Victoria) and 0.78 birds/ha (CW New South Wales). S populations adversely affected by clearance and fragmentation of habitat, and removal of dead and fallen timber; in NE New South Wales, least abundant in smaller (6–20 ha) woodland patches and absent in smallest ones (less than 6 ha), but a detailed study suggested that connectivity of remnants was more important than remnant size, primarily because of females’ reluctance to disperse over large distances of unsuitable habitat.

**Bibliography.** Anon. (1999a, 2006a), Barrett *et al.* (2003), Blakers *et al.* (1984), Boehm (1982), Cooper & Walters (2002a, 2002b), Cooper, Walters & Ford (2002), Cooper, Walters & Priddy (2002), David & Gosselin (2002b), Doerr, E.D. (2005), Doerr, E.D. & Doerr (2002, 2005, 2006), Doerr, V.A.J. & Doerr (2004), Doerr, V.A.J. *et al.* (2006), Garnett & Crowley (1995), Higgins *et al.* (2001), McCarthy (2006), Noske (1979, 1984, 1985c, 1991b), Pizzey *et al.* (2005), Schodde & Mason (1999), Simpson *et al.* (2004), Walters *et al.* (1999).

## 6. Rufous Treecreeper

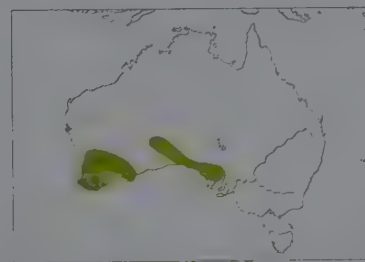
### *Climacteris rufus*

**French:** Échelet roux **German:** Rostbauch-Baumrutscher **Spanish:** Corretroncos Rufo  
**Other common names:** Allied Rufous Treecreeper

**Taxonomy.** *Climacteris rufa* Gould, 1841, Swan River, Western Australia.

Genus name originally introduced with no indication of intended gender, so deemed to be masculine by default. Forms a superspecies with *C. picumnus* and *C. melanotus*. E population (in South Australia) formerly considered by some authors to represent a geographical race, *orientalis*, distinct from form in SW Western Australia, but populations in intervening desert said to be intermediate in characters. Monotypic.

**Distribution.** From SW Western Australia (S from about Geraldton) inland through Great Victoria Desert to N Eyre Peninsula, in South Australia.



**Descriptive notes.** 16.5–18 cm; 30–33 g. Male has supercilium, cheek, ear-coverts, chin and throat rich cinnamon-rufous, thin dark grey-brown eyestripe, often grey-brown suffusion on ear-coverts; forehead, crown, hindneck and neck side light brownish-grey, merging into slightly darker olive-brown on mantle, back and upwringing-coverts; rump and upperpart-coverts similar but with rufous suffusion; tail olive-brown, broad blackish subterminal band on all rectrices except central pair; flight-feathers dull black, with broad pale rufous-buff diagonal band across base; underparts cinnamon-rufous, with grey wash across breast,

patch of narrowly black-edged white streaks on centre of upper breast, indistinct thin cream streaking on lower breast, small black spots on undertail-coverts; iris dark brown; bill and legs grey-black. Female is like male, but streaks on upper breast edged with reddish-chestnut (not black). Juvenile (up to 3 months) lacks cinnamon-rufous supercilium, has crown and neck dark slate-grey, throat and upper breast unstreaked (female) or with pale rufous centres (male); bill mostly pale grey or horn-coloured. Voice. Contact call a piercingly high-pitched “tset”, repeated at intervals of 0.5–1 second, or at irregular intervals (then resembling Morse code), interspersed with very rapid trill of notes (c. 20 per second) that quickly ascend and then descend scale slightly; alarm call a harsh chirring. Calls higher-pitched than those of *C. picumnus* and *C. melanotus*.

**Habitat.** Open woodlands and mallee scrub, dominated by eucalypts such as wandoo (*Eucalyptus wandoo*), powderbark (*Eucalyptus accedens*), brown mallet (*Eucalyptus astringens*), salmon gum and various mallees, usually with grassy or shrubby understorey; also abundant in tall sclerophyll forest dominated by jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) with dense understorey of banksias (*Banksia*), casuarinas (*Casuarina*) or heath. In the wheatbelt of SW Western Australia, wandoo woodland preferred over three other vegetation types (see page 646).

**Food and Feeding.** Mostly ants (Formicidae), but also other insects such as lepidopteran larvae and adults, beetles (Coleoptera), cockroaches (Blattodea), bugs (Hemiptera), wasps and bees (Hymenoptera), termites (Isoptera), dragonflies (Odonata) and grasshoppers (Orthoptera); other inver-



tebrates include earthworms (Oligochaeta), especially when feeding young, also centipedes (Chilopoda), millipedes (Diplopoda) and snails (Gastropoda). Occasionally skinks (Scincidae), and seeds and nectar. Forages at all heights on tree trunks and branches, as well as among litter and logs on the ground. In coastal jarrah forest mostly in trees, ground-foraging accounting for less than 20% of observations. At inland woodland sites, most foraging takes place on ground (65–74%), but seasonal variation: ground used more during winter and early spring, shifting more to trees in late spring through summer and autumn. Females at one site foraged on ground c. 10% more than did males. At one site, when not feeding on ground, foraged largely on wandoo (92% of observations), preferring large trees to saplings. Main technique gleaning (76–78% in two studies); also probes crevices in bark and among litter, and pulls bark from branches; occasionally probes flowers for nectar.

**Breeding.** Season late Aug to early Jan; two broods per season common, three broods recorded once. Breeds co-operatively, with primary (breeding) pair and up to six helpers (mostly males) per nest, also as simple pairs (41% in one study); helpers mostly offspring from previous breeding seasons, but often include also breeding males and non-breeding males and females from adjacent territories. Nest built mostly by breeding female (69% of 146 visits), with some assistance from breeding male and helper males; cup-shaped, built on base of bark strips (up to 30 cm thick) and sometimes dung, then dry grass, cup lined with feathers, fur, wool, plant down and sometimes rabbit or kangaroo dung, placed in hollow branch (“spout”), trunk or stump of living or dead eucalypt, nest-entrance diameter 6–13 cm, depth of hollow 26–91 cm; of 113 nests at one woodland site, 91% in wandoo, of which majority (94%) in spouts (most at angle of more than 50 degrees from horizontal) and 6% in trunks; in jarrah forest, 54% in trunks and 46% in branches; in wandoo woodland, mean height above ground of 48 nests at one site was 8.3 m, and of 12 nests at another site 5.9 m (2.4–13 m); in jarrah forest, mean height of 28 nests was 15 m, but ratio of nest height to tree height was similar in both habitats; of 15 groups that re-nested, five used same site; territory maintained all year, defended by all group-members, defence relaxed in breeding season to allow non-resident visitors, size not related to group size, average at one woodland site 7.8 ha (range 4.6–9.2 ha) but mean of 30 territories at another woodland site 2.6 ha (range 1.6–6 ha). Clutch 1–3 eggs, usually 2 (82% of 34 clutches in one study), slightly glossy, light pinkish-buff, thickly marked all over with dull purple and reddish-brown, laying interval not studied (at one nest, second egg laid 48 hours after first); incubation by female, fed by breeding male and helper males (occasionally) both at nest entrance and off nest, duration of incubation bouts 1–35 minutes (mean 15.8 minutes), incubation period 17 days; chicks brooded by female, young fed by both parents and by any helpers in group (including females), average feeding rate at one site 21.8 visits per hour (range 8–50, dependent on time of day, temperature, and number and age of nestlings); with no helpers, breeding male and female contributed equally; resident helpers (both sexes) contributed similar amount to that of at least one of breeders and, as number of helpers increased, provisioning effort of primary pair declined significantly; nestling period 28 days; juveniles dependent for up to 30 days post-fledging, but first-brood young able to assist in feeding of nestlings and fledglings of second brood; dispersal rates among yearlings higher for females (c. 55%) than for males (23%), about half of surviving males stayed in natal territory for at least 1 year and a further 30% remained for 2 years, whereas 23% and 4% of female fledglings remained for 1 and 2 years, respectively. At one site, 46% of groups re-nested after successful fledging of first brood, and almost 75% of these (mostly groups with helpers) succeeded in raising a second brood. Can breed in first year. Annual adult survival 77% and 75% for breeding males and females, respectively; juvenile survival 76%.

**Movements.** Sedentary.

**Status and Conservation.** Not globally threatened. Locally fairly common to common. Thought to have declined or disappeared in agricultural regions of Western Australia as a result of habitat clearance and fragmentation. Detailed study at site 160 km E of Perth revealed lower reproductive success in fragmented landscapes than in unfragmented ones, this related not to size of habitat remnant but, instead, to higher population densities, and to poorer territory quality caused partly by sheep grazing.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Craig (2002, 2007), David & Gosselin (2002b), Doerr & Doerr (2002), Higgins *et al.* (2001), Luck (1999, 2001a, 2001b, 2001c, 2002a, 2002b, 2002c, 2002d, 2003), Luck *et al.* (2001), McCarthy (2006), Pizzey *et al.* (2005), Rose (1996), Schodde & Mason (1999), Simpson *et al.* (2004).

## 7. Black-tailed Treecreeper

### *Climacteris melanurus*

**French:** Échelet à queue noire

**Spanish:** Corretrancos Colinegro

**German:** Schwarzschnanz-Baumrutscher

**Other common names:** Chestnut-bellied Treecreeper; Allied Treecreeper (*wellsi*)

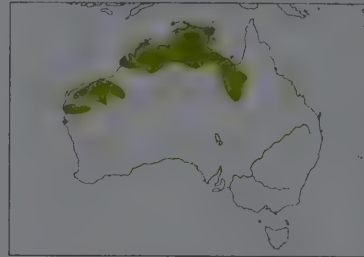
**Taxonomy.** *Climacteris melanura* Gould, 1843, Derby, Western Australia.

Genus name originally introduced with no indication of intended gender, so deemed to be masculine by default. Forms a superspecies with *C. picumnus* and *C. rufus*. Race *wellsi* has in the past been treated as a separate species. Two subspecies recognized.

**Subspecies and Distribution.**

*C. m. melanurus* Gould, 1843 – N Western Australia (E from Broome) and N Northern Territory E to Gulf of Carpentaria uplands and NW Queensland (S to Tropic of Capricorn).

*C. m. wellsi* Ogilvie-Grant, 1909 – Pilbara region of W Western Australia.



**Descriptive notes.** 16–19 cm; 32 g. Male nominate race is blackish-brown above, with indistinct fine white streaks on ear-coverts; upperwing similar, with broad pale cream-buff band across bases of remiges (conspicuous in flight); uppertail blackish-brown; chin, throat and upper breast covered with coarse black-edged white streaking, streaks becoming sparser across lower breast; rest of underparts dusky brown with fine black streaks (except on flanks), undertail-coverts blackish-brown with white lateral spotting; iris dark-brown; bill black; legs dark grey to blackish, pale soles. Female differs from male in having chin and

throat white, bordered with broadly chestnut-edged white streaks on upper breast. Juvenile has chin and throat black-brown with indistinct streaking (male), or dull white with brown mottling (female), rest of underparts much darker, bill and gape-flange pinkish-white. Race *wellsi* is similar to nominate but slightly smaller, and brighter, with neck, side of breast and flanks deep rufous-brown, lower breast and belly pinkish-buff to light cinnamon-brown with indistinct dusky streaks, undertail-coverts broadly and more uniformly barred white. **Voice.** Contact calls strident, high-pitched “ching” or downward-inflected disyllabic “chee-ting”, singly or repeated at intervals of 1–2 seconds. Also, a rapid succession of thinner “peep” notes (8 or more per second). Also sustained “songs” consisting of a series of slightly descending notes, at first accelerating, then slowing, often followed by, or in duet with, shrill, somewhat siren-like, rising and falling “wee-a” notes, repeated six or more times, given by a second individual.

**Habitat.** Open eucalypt forests, woodlands and savannas in monsoon-tropical and semi-arid regions, dominated by such species as Darwin woollybutt (*Eucalyptus miniata*), Darwin stringybark (*Eucalyptus tetradonta*), northern salmon gum (*Eucalyptus tintinnans*) and variable-barked bloodwood (*Corymbia dichromophloia*), often with grassy understorey, but frequently on stony ridges and slopes with little or no understorey; also in riparian woodland with river red gums (*Eucalyptus camaldulensis*), and in acacia (*Acacia*) thickets if eucalypts present.

**Food and Feeding.** Relatively little known. Food mainly ants (Formicidae) and beetles (Coleoptera), also moths (Lepidoptera), grasshoppers (Orthoptera) and unidentified insect larvae, also spiders (Araneae); occasionally visits flowers (e.g. *Xanthostemon paradoxus*), probably for nectar. In one study, foraged on trunks and large branches (75%), dead branches (6%) and foliage (11%) of trees; also on shrubs (3%) and ground (5%). On trees, most foraging at 8–14 m (40%) and 4–7 m (34%) above ground; remainder mostly below 4 m (21%). Foraging techniques primarily gleaning (73%) and probing (21%).

**Breeding.** Comparatively little known. Season Jun–Jan; probably two broods, as laying observed in Jun and Sept–Oct at site near Darwin (Northern Territory). Breeds as simple pair or in co-operative group with one or more helpers. Nest said to be composed of fur, grass and feathers, placed in hollow branch (“spout”) or trunk of living or dead tree, sometimes in stump; of five nests at site near Darwin, three in northern salmon gum and two in Darwin woollybutt, height above ground 3.6–9 m (mean 6 m); elsewhere, nests 3.7–9.1 m up; no estimates of territory size. Clutch 1–3 eggs, usually 2 (mean of eight clutches 2.1), slightly lustrous, light pink colour almost obscured by reddish-brown and purplish-red spots and blotches, intermingled with underlying markings of lavender-grey, predominantly at larger end; incubation probably by female alone, period unknown; no information on nestling period.

**Movements.** Preliminary observations suggest that species is sedentary within year-round all-purpose territory.

**Status and Conservation.** Not globally threatened. Locally common. Recorded densities 0.1–0.6 birds/ha. In most parts of range, habitat subject to regular burning, often annually, but effects of fires still unclear; densities are high in some woodland areas subjected to burning in early dry season (fires mild) or in late dry season (fires hot). The least-known member of its family in Australia.

**Bibliography.** Barrett *et al.* (2003), Blakers *et al.* (1984), Brooker, Braithwaite & Estberg (1990), David & Gosselin (2002b), Doerr & Doerr (2002), Franklin (1999), Higgins *et al.* (2001), Noske (1980b, 2006a), Pizzey *et al.* (2005), Schodde & Mason (1999), Simpson *et al.* (2004).



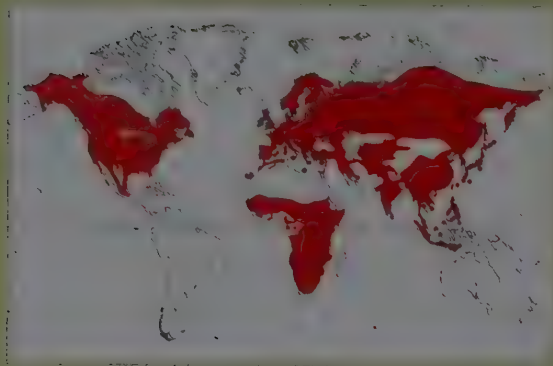


## Class AVES

## Order PASSERIFORMES

## Suborder OSCINES

## Family PARIDAE (TITS AND CHICKADEES)



- Small to medium-sized, plump passerines with short to moderate-length strong bill, strong legs and feet, and short to medium-length tail; soft plumage varying greatly in colour, including yellows, greens, blues, browns, black, greys and white in patches, rather than as streaks or spots.

- 9-21 cm.



- Neartic, Palearctic, Oriental and Afrotropical Regions.
- Most shrubby to wooded terrestrial habitats, from scrub to wooded savanna, carr, all types of woodland, and urban to rural parks and gardens.
- 9 genera, 56 species, 248 taxa.
- 1 species threatened; none extinct since 1600.

## Systematics

The family Paridae includes some of the most intensively studied bird species in the world. In recent years, more than one hundred scientific papers have been published annually on diverse aspects of parid biology. It is ironic, then, that significant developments in parid systematics are among the subjects covered by these papers. Indeed, so confusing has been the intrafamilial classification of the group that it is only in the last decade that any form of consensus has emerged. Before 1998, when the American Ornithologists' Union elevated the subgenera of the American crested titmice and chickadees to the level of full genera, respectively *Baeolophus* and *Poecile*, all except two atypical oriental species, the Yellow-browed Tit (*Sylviparus modestus*) and the Sultan Tit (*Melanochlora sultanea*), incidentally the smallest and largest parids respectively, were classified together in the single genus *Parus*. The AOU's decision, based on a clear morphological distinction between the two groups of North American parids, forced the vexed issue of the family's taxonomy into the spotlight. This was particularly because one Holarctic species, known as the Siberian Tit in the Palearctic and the Gray-headed Chickadee in the Nearctic, was now also represented under different generic names, *Parus* in the Palearctic and *Poecile* in the Nearctic, thus leading to an even more confusing situation. Furthermore, while the *Poecile* tits, meaning the "multicoloured" or "variegated" tits, form a clearly delimited group in Europe, with the Marsh Tit (*Poecile palustris*), the Willow Tit (*Poecile montanus*) and the Sombre Tit (*Poecile lugubris*), the delimitation of the genus farther east became less clear. It is this very problem of fuzziness around the edges of the former, expanded, genus *Parus* that caused the taxonomic conservativeness, or systematic inertia, in the first place.

The AOU's decision had significant taxonomic ramifications also for the *Baeolophus*, or "short-crested", titmice of the New World, because their relationships with the two crested tits of the Old World, now grouped in the genus *Lophophanes*, meaning "showing a crest", were far from clear. Again, a single species, the Bridled Titmouse (*Baeolophus wollweberi*), caused the problem, because, while atypical of the *Baeolophus* group in size and markings, its similarity in plumage, though not in size, to the European Crested Tit (*Lophophanes cristatus*) is striking.

Controversy over the intrafamilial taxonomy of the Paridae is not new. Indeed, the genera now adopted were first proposed, on the basis of plumage, in 1903, by C. E. Hellmayr, and were later

largely supported, as subgenera, by G. Thielcke on the basis of vocalization comparisons. To ornithologists familiar only with the European or North American avifaunas, the new taxa may have seemed reasonable, since, for example, a clear distinction can be made between the European *Poecile* species and the rest. It is when one casts the net more broadly, and is forced to assign such species as the Varied Tit (*Poecile varius*; formerly *Parus varius*) to a genus, that the challenge is encountered. An Oriental species, the Black-lored Tit (*Parus xanthogenys*) of India and the Himalayas, epitomizes the problem. This species, like the Yellow-cheeked Tit (*Parus spilonotus*) of Indochina, is about the size of a Great Tit (*Parus major*) and it exhibits a belly stripe and a nuchal spot, as do most species of *Parus* (in the narrow sense), but it also retains yellow cheeks into adulthood, a character that is atypical of *Parus* but not unusual in *Periparus*, the latter meaning "close to *Parus*". It has a distinct eyestripe, typical of *Cyanistes*, the "dark blue" tits, or of *Lophophanes*, and a black cap more typical of *Poecile*; the black feathers of the crown are drawn into a crest, as seen in *Lophophanes*, *Baeolophus* and some *Periparus* species, but not in *Parus*. In general appearance, the Black-lored Tit is a large, yellow-cheeked tit with a green back; it resembles the Green-backed Tit (*Parus monticolus*), with which it shares the character of a double wingbar, but differs in the possession of an eyestripe and a crest. Clearly, parid systematics could not be sorted out without independent evidence, and the consensus was therefore to lump the whole mess within the, albeit unwieldy, Linnaean genus *Parus* until such evidence appeared.

To add spice to this taxonomic mishmash, a long-standing dissatisfaction with the classification of a small passerine looking rather like a babbler (Timaliidae), and superficially resembling the ground-jays *Podoces* of the crow family (Corvidae), was resolved in 2003 by H. F. James and colleagues. Using extensive osteological and DNA evidence, these researchers showed that the taxon *Pseudopodoces humilis*, first described in 1871, in the genus *Podoces*, and given the English name of Hume's Ground-jay or Hume's Groundpecker, is in fact an aberrant tit, and it has been renamed as the Ground Tit. Subsequent study of the chemistry of its preen-gland secretions support this finding, thus showing it to be the world's second largest tit species, rather than the smallest corvid. The Ground Tit's evolutionary relationship to the rest of the Paridae, however, remains an issue for debate, because different analytical methods have yielded different conclusions (see below). It has also been proposed that the Fire-capped Tit

(*Cephalopyrus flammiceps*), traditionally placed with the penduline tits of the family Remizidae, may actually belong in Paridae, particularly in view of its habit of nesting in tree holes.

The independent evidence required to sort out the rest of the parids has come from DNA-sequencing, and has been published only very recently, in a series of papers. The most important of these, by F. B. Gill and colleagues, was published in 2005. These authors' affiliations, at the Academy of Natural Sciences, Philadelphia, the University of California and Louisiana State University, in the USA, indicate the scale of the project. Their work, based on the cladistic analysis of mitochondrial DNA sequences from 40 parid species, including *Pseudopodoces humilis*, provides the most objective basis yet for the assignment of taxa within this family, and gives considerable insight into the evolutionary history of the Paridae. It is sobering to consider that, just a few years ago, in 2001, most of the species currently included in the Paridae would have been lumped within the single genus *Parus*, and any statement of the relationships among them would have been very largely speculative. It is on the basis of the research by Gill and co-workers also that the British Ornithologists' Union accepted the Hellmayr nomenclature, so recognizing five genera for the six parid species found within the British Isles.

Contrary to early-twentieth-century arrangements, such as that by A. Wetmore, which considered the Paridae to be closely related to the Old World orioles (Oriolidae) and the corvids, *Pseudopodoces* notwithstanding, DNA evidence suggests an arrangement much closer to that proposed by most nineteenth-century systematists, such as S. F. Baird and R. B. Sharpe, and to the 1956 "Basel sequence" of E. Mayr and J. C. Greenway in their "corvids-last" classifications. Genetically, the Paridae form an evolutionary branch, or clade, and are sister-taxon to the penduline tits (Remizidae), with which they have often been grouped as a subfamily within an enlarged family Paridae. Earlier DNA-based classifications have indeed done this, so that the decision as to whether or not to combine them is not directed clearly by the DNA evidence itself. Together, the Paridae and the Remizidae, which on the evidence of genetic distance appear to have diverged about 7–6 million years ago, form a sister-group to other sylvioid families, most closely to the nuthatches (Sittidae) and the long-tailed tits (Aegithalidae). A division from the penduline tits implies an Old World origin for the Paridae, since the remizid tits are almost exclusively Old World, the Verdin (*Auriparus flaviceps*) of south USA and Mexico being the sole exception. Moreover, the family Paridae is most diverse in the Old World: all except one of the parid genera are represented there, and the

three most divergent taxa, namely, the Yellow-browed, Sultan and Ground Tits, are found there; in addition, the four species with the greatest subspecific differentiation, the Great Tit, with 34 subspecies, the Coal Tit (*Parus minor*), with 21, the Willow Tit, with 15, and the Common Blue Tit (*Cyanistes caeruleus*), with eleven, are all Old World species. Paridae is completely unrepresented in the Neotropical and Australasian Regions.

The phylogenetic evidence from an Old World origin is fully supported by the DNA evidence provided by Gill and colleagues' analyses. These show all the species currently treated within the Paridae as a clade, signifying that they are monophyletic, and assist to the three species of remizid included in the analyses for comparison. Gill and colleagues used two statistical methods in order to derive their phylogenetic "tree" (the "A tree" is the single most parsimonious tree, and the "B tree" the maximum-likelihood phylogram). Although these agree on the data (as far as described), they differ in detail at many other points, and there is no clear indication of which tree, if either, may be correct. In most of these cases, the discrepancy makes the difference to one's appreciation of the likely evolutionary path, but in a few cases this can be seen below. Differentiated early in the phylogeny of the Paridae, both trees are the Common Blue Tit and the Azure Tit (*Cyanistes cyaneus*). These form a clade in both, but in the A tree they are basal to the whole family, whereas in the B tree their differentiation occurs shortly after the separation from a more basal clade, which today contains the oriental monotypic taxa *Sitta sumatrana* and *Melanochlora*. The Common Blue Tit and Azure Tit clade is now identified formally as the genus *Cyanistes*. Although *Sitta sumatrana* and *Melanochlora* appear themselves to have diverged very early, it would be hard to find two more disparate forms in the Passeriformes, let alone among the Paridae. The similarity between the diminutive *Sylvioparus* and a leaf-warbler (*Phylloscopus collybitz* Kinglet (*Regulus*)) is also hard to ignore, and perhaps points at the earliest forms of parid. Unlike these *Sylvioparus* and *Regulus* genera, however, *Sylvioparus* exhibits a number of typically parid characteristics, including its voice, a strong sandy bill, blue-grey legs and feet, a hole-nesting habit, a hair-lined nest of moss, and the inclusion of seeds in the diet. All of these characters are shared with *Melanochlora*, and with most other parids. In the *Sylvioparus*–*Melanochlora* clade is basal to the Paridae, this suggests a possible Oriental or perhaps, even more specifically, a Himalayan origin for the Paridae: of the nine parid genera, only *Cyanistes* and *Baeolophus* do not occur in the Himalayas. This view may be further supported by the B tree's positioning of the monotypic *Pseudopodoces*, which is today restricted geographically to the

The evolutionary history of the Paridae is complex, so much so that many disparate groups were until recently lumped into a single unwieldy genus, *Parus*. The emergence of genetic analyses and molecular phylogenies provided the independent evidence required to subdivide *Parus* into several newly accepted genera. One of these, *Poecile*, contains 13 species, including the **Sombre Tit**, which lives in the open woodland, maquis, and orchards of south-east Europe and Asia Minor. Like most of its congeners, it is a study in brown, with a dark cap and bib, a stubby black bill and bluish-grey legs.



[*Poecile lugubris lugubris*, Bulgaria.  
Photo: Mike Lane]





Tibetan plateau, as a slightly more recent branch, yet still basal to all other parids except the *Cyanistes* clade. The A tree, however, differs significantly in its positioning of *Pseudopodoces*, placing it within the great clade of the new genus *Parus* as herewith defined.

Both trees indicate that a major division of the Paridae, which occurred about 5 million years ago, separated what were to become two great clades. One of these contains the further subdivisions now recognized as the four genera *Poecile* (chickadees), *Periparus* (coal tits), *Lophophanes* (Old World crested tits) and *Baeolophus* (New World crested tits); the other contains all species recognized as constituting the now restricted genus *Parus* (great tits). This major division neatly separates the seed-hoarding tits, many of which also excavate their own nest-holes, from the non-hoarding tits, none of which excavates its own nest-hole. For this reason, it is deemed logical that the genus *Baeolophus* be moved from its traditional position, near the end of the species listing, to a position immediately preceding *Parus*.

Within the seed-hoarders, the timing of division into the four extant genera differs between trees A and B, although both indicate that the Old World and New World crested tits form a clade. Following the A tree, this crested-tit clade split off first, and the remaining clade further divided into *Periparus* and *Poecile*. According to the B tree, on the other hand, the chickadee, coal and crested-tit clades originated at similar times. The two trees agree, however, that the further evolution of the crested-tit and chickadee clades involved invasions of North America about 4 million and 3.5 million years ago, respectively, and that the earlier invasion led to subsequent differentiation into the *Baeolophus* clade seen today in North America, presumably evolved from a form closer in appearance to *Lophophanes* species. Interestingly, again in both trees, the Bridled Titmouse, which so resembles the European Crested Tit, appears to be an older form within *Baeolophus* (see also Voice), while the "Plain Titmouse", now split further into the Oak (*Baeolophus inornatus*) and Juniper Titmouse (*Baeolophus ridgwayi*), and the Tufted Titmouse (*Baeolophus bicolor*), along with the Black-crested Titmouse (*Baeolophus atricristatus*), represent a later division into western and eastern forms, respectively. For its part, *Lophophanes* is today represented by a chiefly western Palearctic form, the European Crested Tit, and an Oriental form, the Grey-crested Tit (*Lophophanes dichrous*), the latter confined to the Himalayas, Myanmar and south China.

The genus *Poecile* is clearly differentiated into two major clades. One represents the North American invasion, which was

followed by differentiation into the seven modern-day chickadee species, while the Old World branch showed a clear division between Oriental and Palearctic lineages, the latter's members being more similar in appearance to the Nearctic *Poecile* species. One species, the Siberian Tit (*Poecile cinctus*), represents a return invasion of the Old World from the New World, since it is much closer, both genetically and in its more rufous plumage, to the Nearctic Chestnut-backed (*Poecile rufescens*) and Boreal Chickadees (*Poecile hudsonicus*) than it is to any Palearctic or Oriental species. The colonization of North America by the *Poecile* tits was followed by their differentiation into three further branches. The first of these contained the Black-capped Chickadee (*Poecile atricapillus*) and the Mountain Chickadee (*Poecile gambeli*), two species which form a sister-group to the second branch, the aforementioned *rufescens-hudsonicus-cinctus* clade. The third branch led to the Carolina Chickadee (*Poecile carolinensis*) and maybe also, according to Gill and colleagues' A tree, the Mexican Chickadee (*Poecile sclateri*). It is worth noting that, apart from the more or less non-overlapping ranges of the Boreal and Chestnut-backed Chickadees, the geographical ranges and patterns of allopatry and sympatry in the Nearctic *Poecile* species give little indication of the historical or evolutionary relationships among these taxa.

The Oriental *Poecile* species, consisting of the Rusty-breasted Tit (*Poecile davidi*), the White-browed Tit (*Poecile superciliosus*) and the enigmatic Varied Tit, are distinct in plumage, and would seem to represent either relatively early branches from the main Palearctic/Nearctic lineage or relict forms closer to the proto-*Poecile* ancestor. Both phylogenetic trees suggest that *P. superciliosus* and *P. varius* represent "deep" divisions from the main line, but *P. davidi* probably branched off later from the main Palearctic clade that includes the Marsh and Willow Tits. The systematic position of the Varied Tit has long been problematic. In their important review of the Paridae, S. Harrap and D. Quinn, following Thielcke and J. F. Clements, placed it with another enigmatic species, the White-fronted Tit (*Parus semilarvatus*) of the Philippines, in the subgenus *Sittiparus*. The recent DNA evidence, and the Varied Tit's habits of food-hoarding and nest-hole excavation, however, indicate clearly that this species is an atypical *Poecile*. Interestingly, its closest relative in both trees appears to be the Sombre Tit of the Palearctic, from which its lineage appears to have separated some 4 million years ago. DNA sequences have not yet been published for the globally Near-threatened White-fronted Tit, the behaviour and ecology of which are virtually unknown. In the absence of clear data, it may be safest for the time being to retain this species conservatively within the genus *Parus*.

The two principal Palearctic *Poecile* species, the Marsh and Willow Tits, are sibling species that separated some 3 million years ago. Their present-day distributions suggest that both were once widespread through the Palearctic Region, as indeed the Willow Tit still is, but that repeated periods of glaciation have influenced their ranges, since both species have relict populations, for example the race *brevirostris* of the Marsh Tit and the subspecies *songarus* of the Willow Tit, that presumably represent evolutionary events within former, more southerly, glacial refuges. This is most pronounced with the Marsh Tit, which exhibits a major disjunction in distribution between the Palearctic and Oriental Regions, these populations being separated by more than 1600 km.

Last of the four food-hoarding groups is that of the coal tits, which form a morphologically distinct genus, *Periparus*, centred on the Himalayas. Within the great clade of seed-hoarding tits, *Periparus* species are distinct in their generally small size, in possessing both a distinct nuchal spot and two wingbars, and in the fact that, in contrast to *Poecile*, *Lophophanes* and *Baeolophus*, none excavates its own nest-hole, this perhaps because the *Periparus* tits tend also to have a relatively fine bill. The genus has two main subclades. One contains the two other Philippine species, namely the Elegant Tit (*Periparus elegans*) and the Palawan Tit (*Periparus amabilis*), which Harrap and Quinn, as well as Clements, aligned with the Yellow-bellied Tit (*Periparus venustulus*) of China in a subgenus *Pardiliparus*. The second

*The White-browed Tit is an aberrant member of the genus Poecile. It is large, with a relatively long tail, conspicuous white supercilia and a fairly straight culmen to the upper mandible. On the evidence of morphology and genetics, this species is an early offshoot from the Poecile lineage. It is restricted to the mountains of China, where it breeds in dwarf montane shrubland comprising rhododendron, willow and buckthorn, usually above 3200 m. In the non-breeding season it moves into more heavily forested habitats, and descends to slightly lower altitudes.*

[*Poecile superciliosus*, Ruogai, Sichuan, China. Photo: Nick Athanas]



Until recently subsumed in *Parus*, the morphologically distinct genus *Periparus* contains seven species notable for their small size, pale nuchal spots, and relatively fine bills.

They usually have two wingbars, one on the median secondary coverts and the other on the greater secondary coverts. These bars are formed by small white tips to the covert feathers, producing a dotted impression quite different from the continuous bars seen in some other parids.

The most successful and best-known member of this group is the **Coal Tit**, a conifer specialist distributed across the Palearctic Realm from Western Europe to Japan and Taiwan. Much less well known is the **Rufous-vented Tit**, a denizen of montane broadleaf forests in the Himalayan zone.

This species resembles the Coal Tit in general pattern, especially the pale cheek patch, but differs in its rufous vent, jaunty crest and lack of wingbars. The nominate race is extensively cinnamon on the underparts, while the eastern race *beavani*, pictured here, is largely grey below.

[Above: *Periparus ater ater*,  
Monte Morello,  
Florence, Italy.  
Photo: Daniele Occhiato.

Below: *Periparus  
rubidiventris beavani*,  
Dragons Ponds,  
Yunnan, China.  
Photo: John & Jemi  
Holmes]





In terms of morphology, the tit family is relatively homogeneous, with species varying mainly in size and colour. Almost all tits are small arboreal birds with strong, short or medium-length black bills, dark eyes, rounded wings and soft plumage. The two Old World species in the genus *Lophophanes* adhere to the general theme in terms of structure, as well as plumage. The better-known member, the **European Crested Tit**, has a crest and a black throat, features that recur in several parid groups. The crest—prominent, spiky and permanently raised—is black with broad white fringes to the feathers, creating a scaled appearance. This species is a conifer specialist in parts of its range, including Scotland, but inhabits broadleaf forest in much of southern Europe.

[*Lophophanes cristatus*  
*mitratus*,  
Pyrenees, France.  
Photo: Dave Watts]

According to current taxonomy the European Crested Tit (*Lophophanes cristatus*) and the Grey-crested Tit are sibling species. However, it seems plausible that their similarities are superficial, that they are not each other's closest relatives, and that *Lophophanes* is polyphyletic. Further molecular and vocal analyses are needed to determine their true relationship. The Grey-crested Tit is common in high-altitude broadleaved evergreen, coniferous or mixed forests in the Himalayas and south China.

[*Lophophanes dichrous wellsi*, Dragons Ponds, Yunnan, China.  
Photo: John & Jermi Holmes]



subclade houses the remaining four species, two of which, the largely Palearctic Coal Tit and the Himalayan Spot-winged Tit (*Periparus melanolophus*), are very closely related, are known to hybridize and, on the basis of DNA, may well be conspecific; the Himalayan subspecies *aemodius* of the Coal Tit is crested, and the Spot-winged Tit is distinctly so. A further branch within the non-Philippine subclade contains two sibling species. These are the Black-breasted Tit (*Periparus rufonuchalis*), found in the Himalayas and westwards to Turkestan, and the Rufous-vented Tit (*Periparus rubidiventris*), which occurs in the Himalayas eastwards to Myanmar and south China.

The non-hoarding tits contain the two remaining genera, *Parus* and *Cyanistes*, neither of which exists completely without controversy. Nevertheless, the DNA evidence presents both as distinct clades, although, as intimated above, the inclusion of the White-fronted Tit within *Parus* may be erroneous. For the 23 species of *Parus*, both of the phylogenetic trees presented by Gill and colleagues show a distinct split between the 15 Afrotropical species and the remaining eight, of which all but two, the Great and Turkestan Tits (*Parus bokharensis*), are Oriental species, although A and B trees differ on the origins of the Grey Tit (*Parus afer*) of southern Africa. The distinct plumage characteristics of the 15 Afrotropical tits were recognized by Clements and by Harrap and Quinn when placing them within the subgenus *Melaniparus*. It is a further great irony of parid research that, while the Great Tit has been described as the best-known avian species in the world, many of the Ethiopian and Oriental species of *Parus* are among the most poorly known. In some instances, for example, the nest has never been described, and for many of these species further details of breeding and social organization are unknown. Similarly, *Parus* presents the sparsest DNA dataset of any parid genus; material was available to Gill and his colleagues from only eleven of the 23 species, whereas all *Poecile*, *Lophophanes* and *Baeolophus* tits and all except one *Periparus* species were represented. Consequently, many details of systematics within *Parus* remain open to debate. The Great Tit itself forms a distinct, and relatively recent, grouping with the Turkestan Tit and the Green-backed Tit: the "great-tit clade". It is likely, however, that the relatively great diversity of forms seen across the 34 subspecies of the Great Tit disguises the fact that *P. major* may in fact be better treated as three spe-

cies, *P. major* in the Palearctic, *P. cinereus* in India, and *P. minor* in South-east Asia, the last two having songs differing markedly from those of *P. major*. The White-naped Tit (*Parus nuchalis*) may represent an earlier branching-off from this clade south of the Himalayas, but should probably be included within it. The Oriental forms, consisting of the Yellow Tit (*Parus holsti*), the Yellow-cheeked Tit and the Black-lored Tit, represent a distinct branch, separated from the great-tit clade some 4 million years ago. Within this, both of the phylogenetic trees presented by Gill and colleagues show *P. holsti* to be an earlier offshoot, which was recognized by Clements and by Harrap and Quinn as a distinct genus, *Machlolophus*, while *P. spilonotus* and *P. xanthogenys* are sibling species, as might be predicted from their plumages.

With material from only six of the 15 African *Parus* species available, these are the most poorly represented in Gill's phylogenetic trees. A constant distinction appears to lie between, on the one hand, the black-tit group formed by the Southern Black Tit (*Parus niger*) and the White-bellied Tit (*Parus albiventris*), which should also contain Carp's Black Tit (*Parus carpi*), the White-winged Black Tit (*Parus leucomelas*) and the White-shouldered Black Tit (*Parus guineensis*), and possibly the White-backed Black Tit (*Parus leuconotus*), but not the Dusky Tit (*Parus funereus*), and, on the other, the more rufous Rufous-bellied Tit (*Parus rufiventris*) and Stripe-breasted Tit (*Parus fasciiventer*), a group which presumably should include the Red-throated Tit (*Parus fringillinus*) and the Cinnamon-breasted Tit (*Parus pallidiventris*). The relationships among the African grey tits, consisting of the Somali Tit (*Parus thruppi*), the Miombo Tit (*Parus griseiventris*), the Ashy Tit (*Parus cinerascens*) and the Grey Tit, are, however, unclear. Of these species, which are reminiscent of the more cinereous forms of the great-tit clade, DNA was available only from the Grey Tit. In the A tree, *P. afer* forms an ancient sister-taxon to the Stripe-breasted Tit, whereas, in the B tree, it branches off early from the Oriental *holsti*-*spilonotus*-*xanthogenys* clade, after the latter split from the great-tit clade, raising the suggestion that the African grey tits may represent a separate invasion of Africa, evolving from a lineage distinct from that of the black tits. Under such an intriguing scenario, the subgenus *Melaniparus* used by Harrap and Quinn for the African species would be polyphyletic. It is therefore premature to recognize such a grouping. In this instance, geographical ranges add



useful insight, supporting the view that there are three clear clades. Within clades, species are largely allopatric and form a distributional mosaic. Hence, in the black-tit group, for example, the Southern Black Tit is found in the east of southern Africa, Carp's Black Tit in the west, the White-winged Black Tit in southern Central Africa with an isolated population in Ethiopia, and the White-shouldered Black Tit in West and Central Africa, while the White-bellied and White-backed Black Tits are largely of restricted range in East Africa. Similar allopatry is evident within the rufous-tit and grey-tit groups. Species belonging to different groups, however, are more often sympatric. Hence, the Miombo Tit occurs alongside both the White-winged Black Tit and the Rufous-bellied Tit in brachystegia (*Brachystegia*) woodland in west southern Africa, "miombo" being the Swahili name for brachystegia woodland.

The second of the non-hoarding tit genera is *Cyanistes*, which represents a genetically distinct and morphologically well-defined clade containing the western Palearctic Common Blue Tit and the eastern Palearctic Azure Tit, the "blue-tit clade". The two phylogenetic trees differ, however, in the branch position of this clade in relation to the rest of the family. In the A tree, the blue-tit clade is basal to the whole family, whereas, in the B tree, the split occurs after separation of the Oriental monotypic genera *Sylviparus* and *Melanochlora*, but perhaps not *Pseudopodoces*. Either way, this clade represents a very early split from the main parid lineage. The infraspecific systematics of these species, too, is controversial. Within the eastern forms, a distinction has usually been made between the yellow-breasted form *flavivinctus*, found in central Asia, and the rest. This has been known as the "Yellow-breasted Tit", but recent DNA analysis gives no support for its elevation to species level, and its geographical range suggests that it is a relict population isolated within a glacial refuge. Consequently, it is better treated as a subspecies of the Azure Tit.

Nor has the taxonomy of the Common Blue Tit escaped without issue. Although *C. caeruleus* is well defined within its main western Palearctic range, it is where it has extended into north Africa, and especially the Canary Islands, that the problems arise. The species is represented in north Africa by a well-defined sub-

species, *ultramarinus*, which exhibits the basic colour patterns of the species, except that the darker head markings, such as the crown and eyestripe, which in other races are blue or dark blue, are black and contrast strongly with the white forehead. This does not, in itself, present any problem, but the form appears intermediate between the nominate race and the four taxa found in the Canary Islands. The latter, comprising *teneriffae* on the central Canary Islands, *palmensis* on La Palma and *ombriosus* on El Hierro, both in the west, and *degener* on Fuerteventura and Lanzarote, in the east, have traditionally been included within *C. caeruleus*, although they display a number of distinct plumage characteristics, which are expressed in their most extreme form in *teneriffae*, which has uniformly blue upperparts and lacks white in the wing. Recent DNA evidence is again illuminating. To begin with, it indicates that the larger islands in the group, Tenerife and Gran Canaria, were probably invaded first, and that the other islands were colonized subsequently. Secondly, the genetic distance of these taxa from *caeruleus* suggests that they constitute a full species, the Canary Blue Tit (*Cyanistes teneriffae*), distinct from the rest of the blue tits. The position of *ultramarinus* then hangs in the balance. Does it represent a reinvasion of the continent from the Canaries, or the relict form from which the other Canary Islands taxa were derived, in which case the latter forms should be subspecies of it, or an independent later invasion of north Africa by *C. caeruleus*? This is all still contested, but such consensus as exists suggests that the most appropriate approach is to treat *ultramarinus* as a subspecies of the Common Blue Tit.

Discussion of the status of the blue tits in the Canary Islands reintroduces the subject of infraspecific taxonomy. While it appears that most of the species-level taxa result from branch nodes that occurred more than 2 million years ago, in the Pliocene, the subspecies generally owe their appearance to events that took place less than 2 million years ago, during the Pleistocene, the main recent period of glacial/interglacial sequences, or even in the post-glacial Holocene period, from 12,000 years ago until the present. Nonetheless, it should be noted that the currently recognized pattern of subspecific diversity shows no correlation with the presumed age of the species concerned. For example, relatively recent taxa, such as the Great, Coal, Marsh and Elegant Tits, exhibit high levels of geographical differentiation, with, respectively, 34, 21, eleven and nine subspecies. In comparison, such ancient lineages as those of the Ground and White-browed Tits have just one each. Investigation of the subspecific diversity of the parids reveals that it is not branch length but, rather, the degree of isolation, especially on islands, in mountain ranges and within glacial refugia, that predicts geographical differentiation. Fine examples of this are seen in the Far East: the Elegant Tit, endemic in the Philippines, has radiated into eight subspecies across this archipelago, and the Varied Tit, resident in Korea and the Japanese and adjacent islands, has likewise radiated into eight subspecies in this region. Of the 248 taxa currently recognized, a total of 49, or about 20%, can be defined as island forms. Here, a striking contrast is seen between the Old World taxa and those of the New World, since not one of these island subspecies is found within the Nearctic. There, glacial and montane isolation have played the major role in shaping the avifauna, as they have in the remaining Old World taxa. A good example of the latter is provided by the total of 21 subspecies of the Coal Tit.

The pattern of speciation through the influences of island and montane isolation and glacial and postglacial climate change is most striking in the complex currently classified as *Parus major*. This, the most diverse species in the family, contains 34 races, of which eleven are wholly island endemics. Traditionally, four sections have been recognized: the "nominate section" of green-backed, yellow-bellied Great Tits in the Palearctic contains twelve races, three of them island forms; the grey-backed, whitish-bellied "cinereus section" from south-western Asia to India and Indonesia houses 13 races, including three island forms; and the greenish-backed, white-bellied Great Tits of the "minor section", from eastern Asia and the Japanese islands south to Indochina, incorporate nine races, five of them island forms. The fourth section, *bokharensis*, is now recognized, on the basis of genetic evidence, as a full species, with three races of its own, and recent

Members of the genus *Baeolophus* are restricted to the Nearctic, where they are known by the common name of titmouse. This group contains five relatively large species, all of which are distinctly crested. The **Black-crested Titmouse**, which sports perhaps the most obvious crest in the genus, was until recently treated as a localized southern race of the Tufted Titmouse (*Baeolophus bicolor*). These forms intergrade across a narrow hybrid zone in Texas, but they differ in ecology. Further study is required to clarify their taxonomic status.

[*Baeolophus atricristatus atricristatus*, Roma, Texas, USA. Photo: Arthur Morris/ Birds as Art]



Despite recent shifts in taxonomy, *Parus* retains 22 species and therefore remains the largest genus in the family. The most familiar representative in many regions is the **Great Tit**, a widespread, abundant and vocal bird in Europe and Asia. It is fairly large, with white outer tail feathers and a stripe down the centre of the underparts, these features being common themes in its genus. The width of the black stripe is related to individual characteristics, including dominance, and also provides a means of distinguishing between the sexes. The bird on the right, with a broader stripe, is a male.

[*Parus major major*,  
Mont Valier Nature Reserve,  
Ariège, France.  
Photo: Dave Watts/  
Lochman Transparencies]



analyses, using DNA evidence and hybridization studies, suggest that the other three sections should also be treated as such. Being largely isolated from one another by major landforms, such as the Himalayas, these probably represent early isolation events caused by, for example, glaciation.

The systematics of the Palearctic nominate section merit further comment. Although this section is differentiated into twelve subspecies, no fewer than ten of these either are isolated on islands (three races) or represent former glacial-refuge populations; of the latter, one is found south of the Mediterranean with others in Iberia, Greece, the Middle East, and southern Siberia into northern China. Across the vast area of the Eurasian continental landmass, from the Iberian mainland and throughout central, northern and eastern Europe eastwards through Siberia to Lake Baikal and south to the Altai and Sayan Mountains, a single subspecies, the nominate, is found. This lack of morphological diversification across so great an area suggests a rapid, presumably single recolonization of Eurasia following the last glacial epoch. This hypothesis, based purely on consideration of the subspecific biogeography, is supported by genetic evidence, which indicates that the northern populations had, indeed, passed through a recent genetic bottleneck and expanded rapidly from a narrow genetic base. A similar pattern has been described for the Common Blue Tit.

Hybridization is not known to be widespread within the Paridae. The hybrids hitherto described involve just 19 of the 56 species presently recognized. Furthermore, the validity of several of these is uncertain, and in only seven species pairs, involving 13 species, are hybrids thought not to be rare. None of these more frequently hybridizing pairs involves an intergeneric cross. There are three *Poecile* pairs, namely Willow and Siberian Tits, Willow and Varied Tits, and Carolina and Black-capped Chickadees; one *Periparus* pair, Coal and Spot-winged Tits; two *Parus* pairs, Rufous-bellied and Cinnamon-breasted Tits (not proven) and Great and Turkestan Tits; one *Cyanistes* pair, Common Blue and Azure Tits; and one of *Baeolophus*, Black-crested and Tufted Titmice. In three of these cases, those of the Carolina and Black-capped Chickadees, the Coal and Spot-winged Tits and the two titmice, clear hybrid zones have been identified, and species limits have been contested for many years. In two other cases, the Great Tit / Turkestan Tit and the Blue Tit / Azure Tit, hybridiza-

tion seems to occur periodically when one species extends its range into that of the other, such as happens following the Azure Tit's westward range expansions during very cold winters. Hybridization between Great and Turkestan Tits is thought to occur because of human-induced environmental changes that have favoured incursion by Great Tits. It is possible that human activity, and especially the provision of nestboxes, may have encouraged some of the less likely hybrids, especially intergeneric ones, that have been reported. For example, Great Tit hybrids with the Common Blue Tit, the Coal Tit and the Marsh Tit have been reported, but all are known to be very rare. All of these species will use nestboxes, and the tendency for Great Tits to evict pairs of other species during egg-laying and to take over their nests sometimes results in their raising a few chicks of the other species in their nests. The fate of these adoptees is unknown, but they usually fledge successfully, and the issue of what species they will subsequently prefer as their mate may therefore arise. Whether or not these intergeneric hybrids result from such a scenario is pure speculation, as must be the cause of any of the other rarer hybrids that have been reported, albeit with varying degrees of certainty. These include Marsh Tit × Willow Tit, Coal Tit × European Crested Tit, Coal Tit × Willow Tit, Carp's Black Tit × Southern Black Tit, and Tufted Titmouse × Black-capped Chickadee.

### Morphological Aspects

The genetic distances reported for the Paridae imply that it is a relatively old taxon (see Systematics) which appeared some 7–6 million years ago, and that the major branches of its phylogeny are also more than 2 million years old. This finding is particularly remarkable because it is in no way reflected in the morphological diversity within the group. Apart from the three monotypic genera *Sylviparus*, *Melanochlora* and *Pseudopodoces*, which include both the largest and the smallest parids, Paridae constitutes one of the most conservative avian families in terms of general morphology. For example, although its members range between 9 cm and 21 cm in length, exclusion of the monotypic genera reduces this to 10–16 cm; of the 56 species, 52, or 93%, are between 11 cm and 16 cm long, and 39, or 70%, lie within the length range 12–15 cm. In mass, parids range from 5 g to 49 g, the range



becoming 7–29 g when the monotypic genera are disregarded, but the fact that 85% of the variation in bulk, expressed as the cube-root of mass, can be predicted from the overall size is itself an indication of the general conformity of structure in the family. Its members differ little in the relative length of the bill or the tail.

Apart from size, parids vary morphologically mainly in plumage coloration. The general structural theme, upon which there is relatively little variation, is of a small to medium-sized passerine with a strong, short to medium-length, typically black bill, a dark eye and soft plumage; the short to medium-length, rounded wings contain ten primaries, six secondaries and three tertials, and the tail, which is typically square-ended, has twelve rectrices. The tarsus is of moderate length. The legs and feet are generally bluish-grey, and are strong, as they are in many instances required to support the bird while it is hanging upside-down (see General Habits), and they are frequently used as a means of restraining or stabilizing food items (see Food and Feeding). Plumage colours include black, white, greys, reds, browns, greens, blues and yellows. The plumage is typically coloured in "blocks" that more or less coincide with feather tracts, such as the crown, the cheek, the throat, and so on, because most feathers are uniformly coloured. Frequent exceptions to this are found in the remiges and rectrices, and the wing-coverts, which on many species carry a white tip, forming a spot. Spots elsewhere in the plumage are rare, and are absent from the main body tracts, and no parids display any streaks. Tits are sexually monomorphic, although females often present a slightly paler or less contrasting version of the male plumage.

Although the tits vary widely in colour, this plumage variation tends to be "themed" within genera, and may be highly conservative within a genus. Nowhere is this more apparent than among the 13 *Poecile* species, twelve of which, ranging in size from about 11 cm to 15 cm, are small and grey to brown, paler on the underparts, which are generally buff to white, and have a brown or black cap and bib, the latter of which may be small or extensive, joining the black bill and separated by paler cheeks that match, or are paler than, the colour of the underparts. *Poecile* tits typically lack wingbars and, apart from the Carolina and Black-capped Chickadees, have no white in the tail, although the wing feathers may be paler-edged on the outer web and, as in the *hudsonicus* group, slightly paler-tipped; in the "standard" *Poecile* theme, there is no nuchal spot. The exception to this general theme among members of the genus *Poecile* is the Varied Tit, which, while showing a number of the standard charac-

ters, has a distinct nuchal spot that matches the colour of the forehead, which itself is concolorous with the cheeks. The underparts of this species are of a rich rufous or chestnut colour, and, although reds are not uncommon in *Poecile*, especially in the Nearctic *hudsonicus* clade, the whole pattern is very much more reminiscent of that of the Rufous-vented Tit, which itself is atypical of its genus, *Periparus*, in lacking wingbars. It is this possession of largely genus-specific characters such as nuchal spots and wingbars by one or two members of other genera that so bedevilled attempts to classify parids before DNA evidence became available (see Systematics).

Like the Varied Tit, the nominate race of the Rufous-vented Tit has rich rufous underparts, in this case more cinnamon than chestnut. Dark underparts of this kind are present on several other *Periparus* species, including the Black-breasted Tit, a close relative of the Rufous-vented Tit, and the Spot-winged Tit. The lack of wingbars, however, is atypical of *Periparus*, and is a feature of only one other member, the Black-breasted Tit. The typical *Periparus* pattern shows two clear wingbars, one on the median secondary coverts and the other on the greater secondary coverts; these are formed by white tips, giving a spotted appearance, rather than the continuous bars of other genera. Apart from this, and the presence on some species of a crest, especially in Himalayan taxa, the *Periparus* theme recalls that of *Poecile*. Other differences from *Poecile* are that *Periparus* tits always exhibit a nuchal spot, the bill is typically thinner, and the birds are smaller in overall size, at 10–13 cm. The cheek colour of *Periparus* generally matches, or is paler than, the underparts, which are generally rather rufous. Important exceptions to this are the two Philippine species, the Elegant and Palawan Tits, which have yellow underparts. In the case of the Elegant Tit, the underparts match the cheek colour. In the Palawan Tit, however, the whole head, comprising the cap, the cheeks and the bib, is black, a pattern that is otherwise exhibited only by the Sultan Tit and a very localized British morph of the Great Tit, apart from the essentially all-black African tits and the White-fronted Tit. The Palawan Tit is exceptional also in the male's possession of a yellow mantle, which contrasts with the dark wings, the latter having two bold white wingbars.

In several respects, the plumages of the genus *Periparus* form a bridge to three other genera, two of which are, like *Periparus* itself, hoarders, the other being a non-hoarder. Some *Periparus* are crested, a feature shared with *Lophophanes*, *Baeolophus* and some *Parus*, and with the last-mentioned, especially, *Periparus*



Prominent crests are unusual features amongst *Parus* tits, but a recurring theme in the *Paridae*. Indeed, one general characteristic of the family is that certain morphological traits—including crests, pale cheeks, nuchal spots, dark throat patches and black chest stripes—reappear seemingly at random, making the delimitation of genera more challenging. The **Yellow-cheeked Tit** is an Oriental species, of montane forests from the Himalayas to Vietnam. Little is known about its ecology and breeding behaviour, but it is thought not to hoard its food or excavate its nest-hole.

[*Parus spilnotus*  
subviridis,  
Thailand.  
Photo: Morten Strange]

The main radiation of Parus tits occurs in the Afrotropics. Here, 15 species are currently recognized, many of which are essentially black with patches of white or rufous. This characteristic has given rise to the common name "black tits", while the entire group is sometimes separated into the subgenus *Melaniparus*. The white or rufous appears in different species on different parts of the body, usually on the wings, belly, mantle or iris. In the case of the **White-winged Black Tit** almost the entire wing is white. The nominate form, pictured here, is endemic to Ethiopia.

[*Parus leucomelas*  
*leucomelas*,  
Lake Langano,  
Rift Valley, Ethiopia.  
Photo: Dick Forsman]



Unlike many African parids, the **Somali Tit** is not black. It approaches the Great Tit (*Parus major*) in pattern, although it lacks the yellow or green pigmentation of its more familiar relative. Species with similar plumage patterns are distributed spottily throughout Africa from Somalia in the north to Cape Town in the south. It is possible that these species are more closely related to the typical Parus tits, and that the true "black tits" deserve a genus of their own.

The Somali Tit is distributed in East Africa from Somalia to Tanzania, where it inhabits dry thornscrub, open acacia woodland, and gallery woodland.

[*Parus thruppi*.  
Photo: Jürgen Schneider]

shares the distinct nuchal spot and the presence of up to two distinct wingbars. *Lophophanes* and *Baeolophus* species display no wingbars, but they do have a distinct crest, even in juvenile plumage. The two Old World crested tits, in the genus *Lophophanes*, are reminiscent of *Periparus* also in their small size, 11.5–12.5 cm, and rather fine bill. In these characters they differ strikingly from the larger New World crested tits in *Baeolophus*, which are 11.5–16 cm long and possess a strong, stout bill. In both the Old World and the New World crested-tit genera, the plumage tends to be uniformly brown or bluish-brown above, with the underparts paler, often slightly rufous or sometimes, as in some *Baeolophus* species, with rufous just on the flanks. The exceptions to this pattern are, in the Old World, the European Crested Tit and, in the New World, the Bridled Titmouse, both of which exhibit what are, by parid standards, complex head markings involving a dark or "patterned" cap and crest, and a dark eyestripe that joins up with the dark tips of the ear-coverts. A further dark inner "frame" of the face is formed on both species by black feathers that border the nape and mantle. On the European Crested Tit, this frame joins up with the distal corners of the bib, whereas, on the Bridled Titmouse, it is the ear-covert frame that meets the bib. On the European Crested Tit, at least, the pattern on the rear head and hindneck, when the crest is raised, forms a "false face", a very convincing replica of the face pattern as seen from the front. The purpose of this may be to confuse predators.

The presence of an eyestripe is generally uncommon in the Paridae. The character occurs only nine times in the whole family, and can be considered a generic character only in *Cyanistes*, although a weak stripe may be present in both *Lophophanes* species. The *Cyanistes* tits form a well-defined group in terms of general plumage pattern, but here, again, they are difficult to characterize generically, and such plumage details as wingbars, which seem almost to define *Periparus* and *Parus*, are found to differ in occurrence among subspecies within a single species of *Cyanistes*, as demonstrated by the island races of the Canary Blue Tit. It is in the genus *Cyanistes* that blue becomes a dominant colour in the upperparts, although it varies greatly in intensity, from the pale grey-blues of the Azure Tit to the intense deep colours of the Canary Blue Tit, in line with Gloger's Rule. All have a white forehead, which, in the case of the Common Blue and Canary Blue Tits, continues as bold white supercilia that join above the

nape and separate the dark eyestripe from a blue to almost black cap. As with the crested tits, the face of the two last-mentioned species appears framed by a dark border running from the eyestripe behind the eye and around the ear-coverts and cheek to the small bib; this is the equivalent of the outer frame of the crested tits. Much of this patterning is absent in the Azure Tit, the whole head of which is white, apart from a thin eyestripe linking dorsal to a partial cheek border, which does not extend forwards beyond the line of the closed wing. The bill of *Cyanistes* is among the strongest of any in the family, as its short length, coupled with its relatively great depth, allows for a powerful bite at the







The genus *Cyanistes* contains a genetically distinct and morphologically well-defined trio of species, which together form the "blue-tit clade". These species are distinguished by their small size, active foraging habits, and bright blue plumage on wings, tail and cap. The familiar Common Blue Tit (*Cyanistes caeruleus*) of Europe is replaced to the east by the **Azure Tit**, an angelic-looking species with much white in the plumage, particularly in the wings and tail. These two forms regularly interbreed where their ranges meet. The bird pictured here can be aged as a juvenile by its relatively dull cap and the yellow flange at the gape.

[*Cyanistes cyanus tianschanicus*,  
Tanga, Kyrgyzstan.  
Photo: Hanne & Jens Eriksen]

bill tip. Several small plumage details apparent in *Cyanistes* are reminiscent of characteristics of the other great non-hoarding genus, *Parus*. The yellow underparts, present on the Common Blue and Canary Blue Tits, and hinted at in the yellow-breasted races of the Azure Tit, recall the yellow underparts of the Palearctic and some Oriental *Parus* species; in addition, the hint of a belly stripe on the Common Blue and Canary Blue Tits, and the suggestion of a nuchal spot on the former, are both pointers for *Parus*, as also are the white outer tail feathers of the Azure Tit.

Within both *Parus* and *Cyanistes*, there is a perception that variation among species in plumage coloration is not so much a matter of turning colours on or off but, rather, one of turning up the hue, brightness or contrast. Hence, if the Azure Tit is a monochrome Common Blue Tit, the Canary Blue Tit is a high-intensity version of the Common Blue Tit. In *Parus*, this perception occurs not only with regard to the importance of yellow and green in the plumage, but also in the extent of melanin. Looking first at the green-and-yellow plumages, and taking the Great Tit as a standard, the act of turning up the hue on this produces the Green-backed Tit of the Himalayas and south China, whereas turning down the hue gives the "*Parus major minor* group" and the Turkestan Tit, then the "*Parus major cinereus* group", and finally the grey tits of the African "*Parus thruppi* group". Playing with the extent of black in the plumage leads from the all-black plumaged African tits of the "*Parus niger* group", though these also vary greatly in the extent of white in the wing, through the Oriental White-naped Tit, with its black upperparts, and Green-backed Tit, in the race *legendrei* of which the male's belly stripe has expanded almost to the full width of the underparts, through to the Great Tit group.

Although, as mentioned earlier (see Systematics), two Oriental species, the Black-lored and Yellow-cheeked Tits, carry a number of traits that are atypical of *Parus*, three distinct plumage themes can be defined for *Parus*. These are the black-tit type, the rufous-bellied-tit type and the great-tit type, corresponding largely, but not exactly, with the black-tit, rufous-tit and grey-tit clades, respectively (see Systematics). The black-tit type includes the White-shouldered Black, White-winged Black, Southern Black and Carp's Black Tits and the White-bellied Tit, which form a well-defined grouping. In terms of plumage alone, this

may include also the White-backed Black and the Dusky Tits, although the evolutionary and systematic relationships of these two species are unclear, and their similarity in plumage to the other African black tits may be due to convergence, rather than to a common evolutionary history. The basic pattern displayed by all of these tits consists of a predominantly black plumage, with white in the wing varying from none in the White-backed Black Tit, which has a pale brownish mantle, through distinct wingbars and carpal patches, as in the southern African species, to the extensive white patches on the shoulder, wing-coverts and outer remex webs of the White-shouldered Black Tit. In the White-bellied Tit, the belly, flanks, vent and undertail-coverts are also white. Apart from the White-shouldered Black, White-backed Black and Dusky Tits, these species also exhibit white in the outer rectrices, a character found in all except four of the 23 *Parus* species, thus in all other African members of the genus. In addition to its lack of white in the tail, the White-shouldered Black Tit is unusual in the Paridae in having a distinctive whitish or yellow iris, a character shared with just one other tit, the Rufous-bellied Tit, which has a yellow iris. The juvenile's iris is grey, the juveniles of the latter species having a brown iris. In the rest of the family, iris colour is typically dark brown in juveniles, becoming slightly more reddish in adulthood, but in all cases being so dark that these distinctions can be recognized only in the hand; in the field, the eyes appear black. The significance of pale irides apparently evolving independently in two lineages of African *Parus* is unknown, but eye colour could certainly indicate an individual's age and therefore be of some significance for social behaviour.

Unlike the black-tit type, the rufous-bellied type, comprising the Rufous-bellied, Cinnamon-breasted, Red-throated and Stripe-breasted Tits, exhibits a contrast between darker, generally grey, upperparts and rufous underparts. All have two wingbars, formed by white tips and edges on the greater and median wing-coverts, and bold white edges on the otherwise darker tertials, as well as a variable amount of black on the head. The extent of black on the head varies from a reduced cap, as on the Red-throated Tit, to a hood, as on the Rufous-bellied and Cinnamon-breasted Tits, and to a hood extended into a ventral stripe, as shown by the Stripe-breasted Tit. The last-mentioned species is the least ru-



fous of the group, and, with its greenish-grey mantle and belly stripe, it grades in appearance towards the great-tit type, represented in Africa by the grey tits.

In contrast to the previous two *Parus* types, which lack white cheeks and a nuchal spot, all members of the great-tit group possess these characters. The African grey tits generally share with the rufous-bellied tits the bold wing patterning formed by pale covert edges. This is much reduced or absent in the Palearctic and Oriental *Parus* species, although the bold tertial edges are generally present. The general plumage theme of the great-tit type is of darker upperparts of grey, green or black, paler underparts of white or grey to yellow, a black cap extending from the bill to the nape, and a similarly coloured shield-shaped bib which may extend ventrally into a belly stripe, this stripe tending to be more complete on the Palearctic and Oriental species than on the African ones. The cheeks are typically white, contrasting with the rest of the plumage, although on the Miombo, Yellow-cheeked and Black-lored Tits, as well as the Yellow Tit, they match the colour of the underparts. The cheeks are also typically framed by a black border joining the bib to the cap at the nape, but this is incomplete on several African and Oriental species. The Yellow Tit is exceptional in its cap pattern and colour and in its lack of a bib, although a black vent contrasting with otherwise yellow underparts hints at a belly stripe.

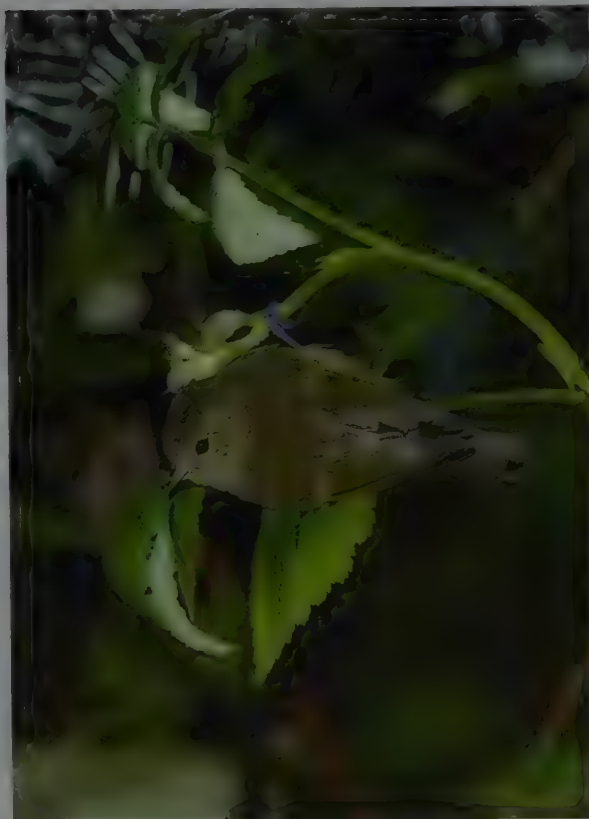
In general, *Parus* species are larger than other tits, ranging in length from 11.5 cm to 16 cm, 80% of the 23 species being 13–16 cm long. In this respect they are reminiscent of *Baeolophus*, which may represent their ecological equivalents in the Nearctic. The larger size is a characteristic also of *Pseudopodoces*, the Ground Tit, which may be closely related to the great-tit group. Its plumage recalls that of the great tits in its darker upperparts, its pale nuchal spot and its distinct cap extending to the base of the bill, and in its white outer tail feathers. On the other hand, it differs markedly from them in the lack of any bib or belly stripe and in its brownish, rather than grey or yellow/green, general cast.

The problem of traditional parid systematics, then, is that plumage characters that seem almost to define infrafamilial taxa do not quite do so. The wingbars, eyestripes, nuchal spots and white outer tail feathers crop up in odd species here and there, irrespective of generic affiliation. This undoubtedly reflects the great age of the family and, therefore, the fact that many of these



species represent relicts from older taxa; frequently, the isolation events that resulted in speciation are indiscernible. Given that many plumage characters do transcend generic boundaries, however, we may consider, and perhaps speculate a little on, the functions of these plumage characters. To do this, we must take into account the sociality of the parids (see General Hints), since most are highly gregarious and associate, at least for part of the year, with conspecifics and/or join mixed-species flocks. The head pattern of most parids, with a cap, eyestripes, pale cheeks, a bib and so on, conveys information on social status, condition and, in conjunction with posture, to some extent also intention, because, in "radiating" from the bill base, they indicate accurately the angle of the bird's head in relation to the viewer.

In general, social status among the tits is strongly determined by sex, males dominating females, and age, adults dominating first-years and juveniles. Plumage characters that indicate sex and age, therefore, implicitly provide information on the status of the individual and tend to result in potential conflicts being resolved, without escalating to harmful agonistic interaction such as fighting. With many species, females resemble males in their essential plumage pattern, but the intensity, or chroma, may be duller and less contrasting. This is true of *Parus*, *Cyanistes* and *Periparus* tits, but much less so of *Poecile*, *Lophophanes* and *Baeolophus* and perhaps also the monotypic genera, in which the sexes are virtually identical in plumage. This difference in the degree of sexual dichromatism appears to reflect the social organization of these species, since many tits in the latter genera pair for life and defend group and/or year-round territories, whereas species in the first three genera tend to re-pair each year and establish new territories, although both the territory and the partner may be the same as in the previous year. Irrespective of social organization, however, males of most species are larger than the females, a fact that probably contributes to their social dominance. Although the degree of size dimorphism may vary even within species, from one habitat to another, the sexual size difference, measured as wing length, of British *Parus*, *Periparus*, *Poecile* and *Cyanistes* species occurring at the same woodland site was about 4% of the male's size, irrespective of the large differences in absolute size of these species. The small sexual differences in plumage pattern, such as bib size, belly-stripe width and ultraviolet Vire-



The **Canary Blue Tit** has traditionally been lumped with the **Common Blue Tit** (*Cyanistes caeruleus*), but its isolated range and divergent mitochondrial DNA suggests that it is better treated as a separate species. Genetic data indicate that the large islands of Tenerife and Gran Canaria were probably colonized before smaller islands in the Canary archipelago. The species differs from European forms of the Common Blue Tit in its bluer back, darker cap, and reduced white in the wing, and thus more closely resembles North African forms. Further research is necessary to clarify the taxonomic arrangement of these forms.

[*Cyanistes teneriffae palmensis*, Los Tilos, La Palma, Canary Islands.]

Photo: Johannes Ferdinand]

The **Yellow-browed Tit** is an aberrant parid, and sole occupant of the genus *Sylviparus*. With its tiny size and uniform greenish plumage, it resembles a leaf-warbler (*Phylloscopus*) or a kinglet (*Regulus*), perhaps hinting at the evolutionary origins of the Paridae. Unlike those groups, however, the Yellow-browed Tit is a typical parid in several morphological and behavioural features. It has a stubby bill, blue-grey legs and feet, agile foraging behaviour, and hole-nesting habits. It is found from the Himalayas to south China and northern Indochina, with an isolated population in the Da Lat Plateau of southern Vietnam.

[*Sylviparus modestus modestus*, Emei Shan, Sichuan, China.]

Photo: Christian Artuso]





flectance of the cap of *Periparus*, *Parus* and *Cyanistes*, respectively, concern characters that are known to be sexually selected and to indicate, by providing an honest signal, various aspects of the individual bird's fitness or condition.

As in the female plumages of these species, such characters are typically absent or greatly toned down in the juvenile plumages. Hence, in juvenile *Periparus*, the bib is either much reduced and diffuse or "washed out", as in the Coal and Spot-winged Tits, or absent altogether, as in the Elegant and Palawan Tits. A similar tendency towards reduced bib contrast is seen in young *Poecile* tits, although a small bib is usually present. The belly stripe of adult *Parus* species of the great-tit type is much reduced or absent on the juvenile, as also is the facial frame. Black plumage components, such as the cap and the bib, have a greenish cast which, together with pale yellow cheeks, presents a much less contrasting appearance than that of the adult. In the genus *Cyanistes*, the blue UV-reflective cap of the adult Common Blue and Canary Blue Tits is replaced in juvenile plumage by a dull greenish cap, in addition to which the bib is absent, the facial frame is much weaker, and the white forehead, supercilium and cheeks are picked out in yellow, giving the juveniles, as in *Parus* and most *Periparus* tits, a much less contrasting and, perhaps, less confrontational appearance. The greater presence of yellow in the plumages of juvenile *Parus*, *Periparus* and *Cyanistes* may be adaptive in reducing conflict, because the juveniles, since they carry no secondary sexual characters, avoid the triggering of territorial confrontation; their plumage represents a sort of passport enabling them to move freely between territories during the exploratory phase, when they are first independent of their parents. Parid juvenile plumages may also be more cryptic, providing the birds with better camouflage from predators during the time in their life when they are most vulnerable. It is interesting that these age-related plumage differences are generally not apparent in *Poecile*, *Lophophanes* and *Baeolophus* species, which may have more protracted post-fledging periods of juvenile dependency. It is also worth speculating on whether the plumages of some, especially Oriental, *Periparus* and *Parus* species, in which the adults have extensive yellow on the underparts, including the cheeks, have evolved

through neoteny, the process by which juvenile traits are retained into adulthood.

After the post-juvenile moult, the secondary sexual characters are present, although they may still be less intense than they will be after the first full post-breeding moult. Apart from these characters, most of the known age-related plumage differences relate to those feather tracts of the wing and tail specifically changed in the post-juvenile moult, and are evident in the contrasts between moulted and unmoulted feathers. The moults of *Parus*, *Cyanistes*, *Periparus*, *Poecile*, *Lophophanes* and *Baeolophus* are essentially similar in extent, in that juvenile remiges, primary coverts and a variable number of outer greater coverts are retained; in the last four of those genera, however, the colour of the adult feathers may appear to the human eye to be so similar to that of the juvenile ones as to provide no useful clue to age, although this does not necessarily mean that the birds themselves cannot see a difference. A few examples of the way in which first-years differ from adults may be instructive. In the genera *Parus* and *Cyanistes*, the retained juvenile primary coverts of the nominate race of the Great Tit and those of the Common Blue Tit are green, and contrast with the blue lesser and median coverts, whereas the adult has these parts of the plumage all of the same colour. In *Periparus* species, any retained juvenile greater coverts contrast with newly grown ones. With *Poecile*, *Lophophanes* and *Baeolophus* tits, the shape of the tail feathers is the best guide to age, first-years having narrower and more pointedly tipped rectrices than those of the adults, which are broader and more rounded. The extent of white in the outer rectrices may be useful in ageing some Nearctic *Poecile* species, and the colour of the roof of the mouth, blacker in the adult and greyer in the juvenile, may be useful for some *Baeolophus* tits.

Apart from any crypsis that they may provide, parid plumages also signal much about the individual wearing them. The pattern of the plumage is not generally changed through feather wear, but any worn plumage will appear duller and/or sun-bleached, and carotenoid-pigmented plumage is known to wear more rapidly than does melanin-pigmented plumage. This may be why badges, such as bibs, belly stripes and similar markings, are usually melanin-based. An important exception to the general picture is provided by the Dusky Tit. This species has whitish or greyish fringes on many wing-coverts and the tertials, and these are lost with wear. The importance of plumage wear, for example in signalling an individual's condition, has been little explored for the tits, and its significance to the Dusky Tit is unknown. In relation to age and sex, the signalling value of the plumage has already been described, but recent work on the Great Tit reveals that carotenoid-based plumage may also indicate an individual's condition in a sophisticated way. The principal yellow pigments in tits are lutein, zeaxanthin and, to a lesser extent, cryptoxanthin. The first of these is obtained chiefly from caterpillar prey, and the yellowness of the plumage appears to be directly proportional to the quantity of lutein in the feather. Since this is related to the diet available to the bird during the moult period, non-genetic differences in yellowness are found between populations inhabiting sites that differ in caterpillar abundance. Hence, yellow hue represents a complex trait that integrates information on diet, habitat quality and foraging ability of the individual. The feather's structure, however, is also important in determining the colour presented, and this has been found to be correlated both with the bird's relative mass, which is a simple measure of condition, and with the saturation of colour presented. Furthermore, the lightness of plumage may be related to the quantity of zeaxanthin present, and may indicate parasite load. In combination, therefore, the hue, the colour saturation and the lightness of the plumage may indicate territory quality, nutritional status and even the parasite load of the individual. It is worth noting also that Great Tits of the nominate race and subspecies *newtoni* that moult in captivity, deprived of dietary lutein, are grey, strongly reminiscent of the Turkestan Tit and the *cinereus* types of the Great Tit, and thereby raising questions about the genetic basis of the plumage differences between these taxa.

It appears, then, that the great diversity in plumage patterns seen in the Paridae can, to some extent, be predicted from knowledge of the birds' social behaviour and trophic ecology. Simi-

*The largest member of the family is the Sultan Tit, which weighs in at more than double the figure of many relatives. Its conspicuous foraging habits, loud voice, striking black and yellow plumage and flamboyant crest make it one of the most conspicuous and unmistakable birds of South-east Asian temperate forests. The plumage is a beautiful silky texture, and the crest is so long as to be floppy. The species occurs from the Himalayas to south-east China, Vietnam and Peninsular Malaysia.*

[*Melanochloris sultanea flavocristata*, Peninsular Malaysia. Photo: Morten Strange]



In addition to genetic factors, a number of important determinants of body size have been identified for several parid species. Most of these ultimately relate to the quantity and quality of food delivered to the growing chick. Body size, however, also varies geographically both among species within the same genus to some extent, and, more clearly, among individuals within the same species. In both cases, the variation is consistent with Bergmann's Rule, which predicts that individuals should be larger, on average, within populations inhabiting colder climates. Among

[*Pseudopodoces humilis*,  
Ruergai, Sichuan, China.  
Photo: John & Jemi  
Holmes]







Almost all parids are arboreal birds, and as such they inhabit a range of forested and semi-forested habitats. Many live in broadleaf or mixed forests, while a few are conifer specialists, at least in parts of their range. The **Coal Tit** is one of the latter. In some regions it lives almost exclusively in spruce (*Picea*) forests, while in others it inhabits forests of pine (*Pinus*) or larch (*Larix*). In drier regions it relies on juniper, cedar, hemlock or birch, and in western Europe it thrives even in heavily modified habitats such as intensive conifer plantations and suburban gardens. Pairs of Coal Tits even defend territories around small clusters of pines or yews in urbanized city centres. The preference for conifers in this species runs deep: if a captive bird is offered the choice of two twigs, one of a pine, the other of an oak (*Quercus*), it will preferentially select the pine twig as a perch.

[*Periparus ater britannicus*,  
Wales.  
Photo: Stephen Dalton/  
NHPA]

Low-stature forests are home to several parids, including the **Bridled Titmouse**. This species is distributed from the southern USA, in Arizona and New Mexico, to Oaxaca in southern Mexico. Throughout this region it lives in a variety of drier forests, including oak (*Quercus*), pine (*Pinus*) and juniper (*Juniperus*) forests in the montane zone, and dense scrubby forests at lower altitudes. In Arizona, for example, it breeds in low-lying areas with a growth of willows (*Salix*), cottonwood (*Populus*) and mesquite (*Prosopis*).

[*Baeolophus wollweberi phillipsi*, Madera Canyon, SE Arizona, USA.

Photo: Dave Maslowski/Maslowski Productions]



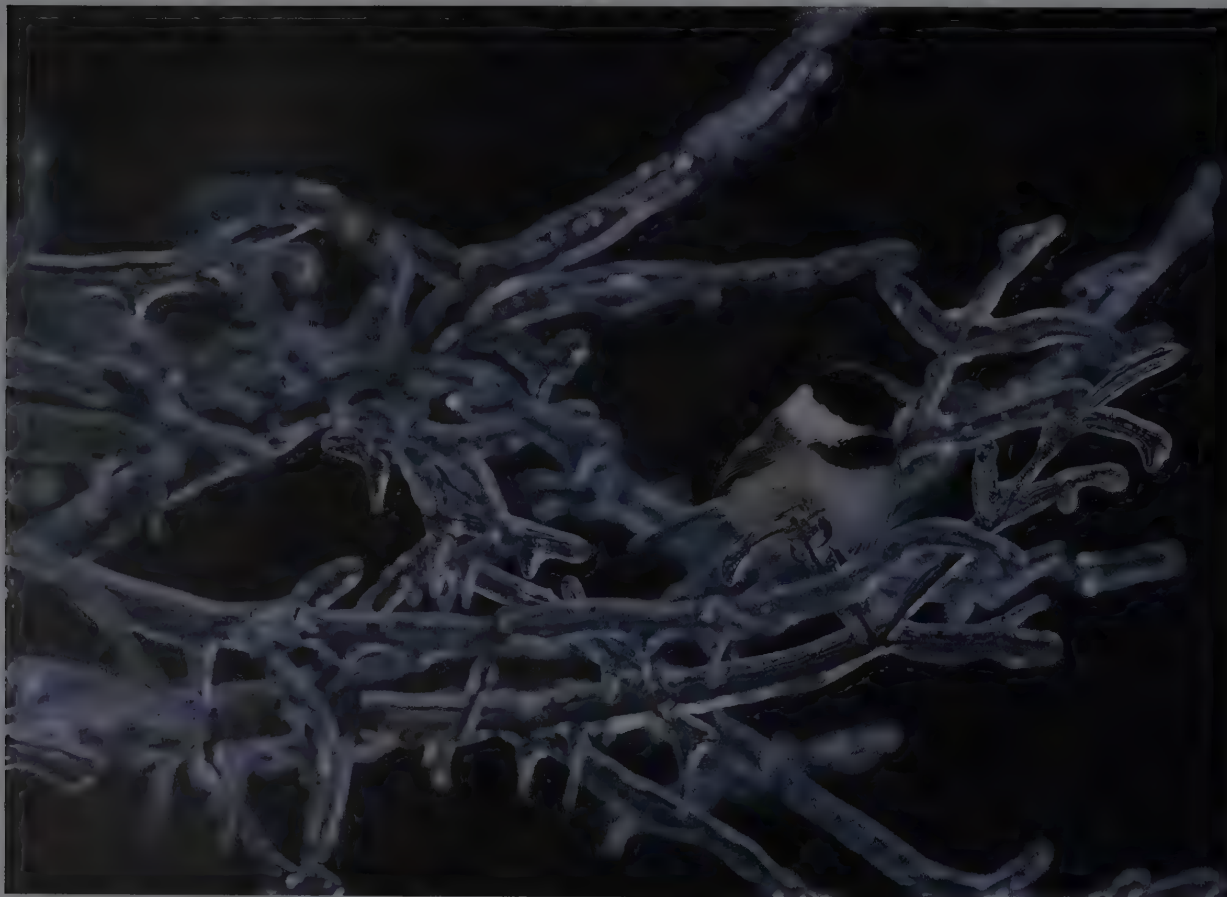
the genus *Remiz*, whereas in corvids it attaches to the maxilla or to both the maxilla and the jugal arch. Of 13 cranial characters listed, one is a distinct arrangement of the nasofrontal hinge, the hinged bone joining the base of the upper mandible to the cranium: in the Paridae, the maxilla abuts the frontal bone at the nasofrontal hinge, and the hinge is a straight cartilaginous band, allowing retraction of the upper mandible (rhynchokinesis) in an exaggerated forceful bite, whereas the corvid maxilla overlaps the frontal bone at the hinge, and the hinge is irregular in shape and restricts rhynchokinesis. Seven characters listed for the mandible include the fact that, in corvids, a bony crest extends from the medial process to the lateral condyle, creating a flat surface of bone in the posterior view of the mandible; this crest is absent in parids. Two characters of the hyoid skeleton are presented, both of which clearly distinguish parids from corvids. Four characters of the vertebral column are identified, including moderately developed to well-developed paired bilateral fossae on the ventral faces of many of the synsacral vertebrae in the Paridae, these being weak or absent in the Corvidae. One character relates to pneumatic foramina on the dorsal surface of the sternum, which in most parids consists of a single opening, or sometimes several openings, near the rostrum. This differs from the character state both in *Pseudopodoces*, in which foramina are absent, and in the corvids, in which they are extensive, especially across the cranial third of the bone and along the mid-line. Two characters are recognized for the coracoid and furcula, and both of them distinguish parids from corvids. In the wing, two characters of the humerus and one of the ulna are listed, and five characters are identified in the pelvis, although two of these latter appear to be redundant in defining parids osteologically. In all, of the total of 55 characters, no fewer than 39 distinguish, or largely distinguish, parids from corvids, and in all these respects *Pseudopodoces* is a parid.

Many, perhaps as many as half, of the distinctive osteological features of parids relate to the bill, and it may therefore be appropriate that much of the ecomorphological research that has been undertaken on the Paridae has focused on variation in the bill, both among and within species. Moreover, at least one subspecies, the race *newtoni* of the Great Tit, has been defined purely on the characteristics of the bill. Within species, the size and shape of the bill tend to vary, in relative terms, more than does any

other size character, such as wing or tarsus length, but this tendency itself varies among species. This is largely because some species, or some populations, are strongly sexually dimorphic in bill size and shape, whereas others are not, and the degree to which this is so appears to depend on the relative social dominance of the species. For example, in a British woodland parid community consisting of the Great Tit, Common Blue Tit, Marsh Tit and Coal Tit, in which the species could be ranked in this order in terms both of overall body size and of social dominance, the relative variation in the bill was also ranked in this, descending sequence, because this Great Tit population exhibited strong sexual dimorphism in the bill, while the Coal Tits showed little or none other than that expected from the general dimorphism in body size, which was similar for all four species. The Common Blue and Marsh Tits were intermediate in sexual dimorphism of the bill. The mechanism proposed to account for this suggests that sexual dimorphism evolves in response to intraspecific competition, which is strongest in the socially dominant Great Tit. It is weakest in the small, subordinate Coal Tit, for which interspecific competition prevails. Supporting evidence for this idea came from a study in Ireland, where three of these species occurred in more or less discrete habitats, and the fourth, the Marsh Tit, was absent. Here, Coal Tits experienced only intraspecific competition, and were significantly more sexually dimorphic in the bill than were those in the British wood. The phenotypic plasticity of bill form in the Great Tit, with, for example, sex-specific seasonal change tracking changes in the intensity of social interaction with changing food availability through the year, calls into question the degree to which the bill's morphology can be regarded as strictly under genetic control, rather than being honed for a purpose by the bird's activities, either deliberately, through bill-wiping, or otherwise.

Variation in the bill need not reflect variation in the underlying skeletal elements, since the rhamphotheca, the horny covering of the bill, consisting of keratin, is continuously growing. For the Great Tit, it has been shown that, while the size of the skeletal elements varies with that of the general body size, the size of the rhamphotheca is independent of this. Indeed, it may change seasonally, as it tracks the individual's seasonal change in diet, from insects to seeds and back, and the sexual dimorphism evident in





Tits reside further north than most other passerines. The **Black-capped Chickadee** inhabits Nearctic forests as far north as Newfoundland in the east, and Alaska in the west. Despite its small body size, it does not escape southward in winter, preferring to endure freezing conditions. It is seen here perching in low branches encased with ice! It often favours native forests such as those dominated by birch (*Betula*) or alder (*Alnus*), or the pinyon-juniper (*Pinus-Juniperus*) forests in the Rocky Mountains. Like many north temperate species it occurs at higher elevations in the south of its range, reaching 3200 m in New Mexico.

[*Poecile atricapillus atricapillus*, Montebello, Canada. Photo: Roland Seitre]

this species reflects sex differences in foraging specialization. Furthermore, as the bill size of the Great Tit also determines the size of prey that can be taken during the breeding season, sexual dimorphism may act to reduce competition between members of a breeding pair. The extent to which this is so depends on the degree of competition experienced by the pair-members, and this, in turn, depends on the population density and food availability. Hence, the effect varies among populations, habitats and years.

The form of the bill is one of the most distinctive characteristics of parid genera, being stoutest in *Cyanistes* and some *Baeolophus*, generally intermediate in *Poecile* and *Parus*, and finest in *Periparus* and *Lophophanes*. *Pseudopodoces*, with its long, curved bill, is an extreme case. The bill tends to be finest among species of coniferous forest, such as *Periparus* and *Lophophanes* tits, which pick fine insects from among the conifer needles, and stouter among species that prefer broadleaf deciduous forest, which include most other genera. This bill difference has been described also for populations of Great Tits inhabiting coniferous or broadleaf forests, which tended to have, respectively, a finer bill or a stouter one. Finer bills are clearly related to a more insectivorous diet, and stouter bills to a more seed-based and nut-based diet, so that the Great Tit's dietary shift, from insects in summer to seeds in winter, is paralleled by a shift to a stouter bill in the winter months. Related to this is the tendency for stouter-billed individuals or species to forage more on or near the ground, and for finer-billed individuals or species to be more arboreal, although there are clear exceptions to this, as illustrated by the Common Blue Tit, which is highly arboreal. Hence, it is apparent that both interspecific and intraspecific variation in form correspond strongly to differences in ecology, such as habitat preference, and this is discussed in the following section.

## Habitat

The diversity of habitats in which parids occur reflects both the huge geographical area over which the family is found and the behavioural adaptability of several of the species. Generally ex-

cluding hot, cold or ice deserts, tits and chickadees can be encountered in most of the vegetated terrestrial biomes of the zoogeographical regions in which they occur. Within these biomes, they are found in most habitats, including wetlands to some extent, but many have specific adaptations, for example of the bill (see Morphological Aspects), or requirements, such as for soft dead wood for nest-hole excavation (see Breeding), that predispose them to certain species-specific, optimal habitats. The population density is typically more stable over the years within optimal habitat than it is in suboptimal habitat; this is because, in accordance with the "Ideal-free Distribution" theory, birds "fill up" the better habitat first, individuals arriving subsequently being forced into poorer habitats. Another characteristic that contributes to habitat preference is the rate of song degradation with distance from the singer, which differs from one habitat to another, as has been demonstrated with, for example, the Black-capped Chickadee, the Great Tit and the Common Blue Tit.

Naturally, in consideration of all these factors, a species shows a preference for its optimal habitat. Indeed, species associated with coniferous woodland, such as the Coal Tit, even prefer to perch on a pine (*Pinus*) twig rather than on oak (*Quercus*) if given a free choice. Significant differences in the degree of habitat specialization are nevertheless evident among species, and this is reflected in their geographical ranges. Hence, while a few parids, such as the Great Tit in the Palearctic and the Black-capped Chickadee in the Nearctic, occur in a broad range of habitats, being found in a variety of woodland types, as well as scrub, parks and gardens, in both urban and rural situations, most members of the family are more restricted in their choice, as typified by, for example, many of the African *Parus* species and the Carolina Chickadee. Nevertheless, even the least habitat-specialized species have an optimal habitat in which they achieve their greatest breeding density and breeding success, and in which populations are more stable than they are in suboptimal habitat. For the Great Tit in Britain, for example, oak woodland represents this optimal habitat.

Across a species' range, the extent to which it can express its habitat preference is naturally limited by the availability of either

The **Varied Tit** occurs in the Far East, where it occupies a geographically variable spectrum of habitat types. In mainland China it tends to inhabit open deciduous and mixed forests; on Taiwan it prefers lowland conifer forests; and in Japan it is usually found in mature deciduous, mixed and evergreen broadleaf forests. Despite harsh winters in the northern portion of its range, and regardless of habitat choice, it is essentially resident. Although this species is relatively large, it bears a strong resemblance to some *Pariparus*. However, recent DNA evidence, along with its habits of food-hoarding and nest-hole excavation, clearly indicate that it is an aberrant *Poecile*.

[*Poecile varius varius*,  
Tomakomai, Hokkaido,  
Japan.

Photo: Hirozo Maki]



the optimal habitat or surrogates. As an example, the Common Blue Tit is typically an inhabitant of oak woodland, and it shuns large stands of conifers. In north-west Europe, this is reflected in its reaching its highest densities, often more than one pair per hectare, in pedunculate oak (*Quercus robur*) woods. In north Africa, this tit is characteristic of cork oak (*Quercus suber*) but, when it moves to higher altitude, such as in the Atlas Mountains, it is found in pine and cedar (*Cedrus*) woodland, as well as in montane oak woodland. This species frequents similar habitats at high elevations in the eastern Mediterranean and the Middle East.

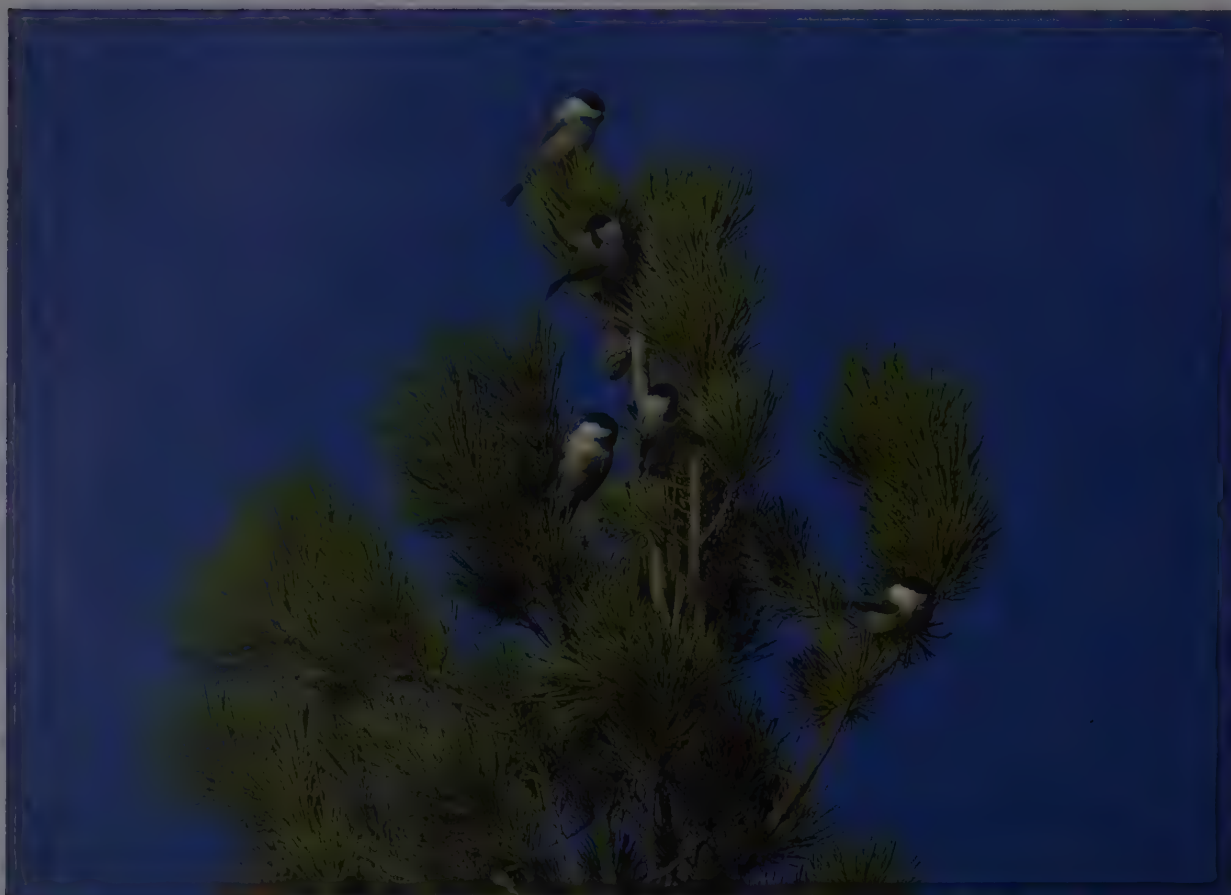
The Paridae featured prominently in D. Lack's classic 1971 work *Ecological Isolation in Birds*, in which the author observed that two congeneric species rarely occupied the same habitat, and that, if they did, they would tend to occupy significantly different ecological niches within it. Although the classification of the tits at that time in a single genus (see Systematics) presented some problems for this argument, Lack realized that, in this family, the level of subgenus appeared to be more appropriate. It seems, therefore, that his observations on habitat occupancy pre-empted the promotion of subgenera to genera that was to occur some 30 years later. As a general principle, Lack observed that two congeners rarely occupied the same location without some shift of niche space occurring, a fact already remarked upon with regard to the sympatric African *Parus* species (see Systematics). Hence, for example, the seven parid species found in western Europe now represent six different genera. More recent research on habitat occupancy by tits has attempted to identify specific habitat characteristics that affect the fitness of the birds, such as canopy height in the case of the Marsh Tit and oak-tree density and soil type in the case of the Great Tit.

As habitat preference is dictated by the close integration of a species' ecology, behaviour and morphology, it should be expected that, despite the breadth of habitats occupied by parids, there are some general patterns broadly associated with the genera. The suggestion that the Paridae possibly originated in the Himalayas (see Systematics) would indicate that they are typically birds of high-altitude, evergreen or montane deciduous forest and associated habitats, although it should be noted that bird species asso-

ciated with high elevations when at low latitudes are often found at lower elevations when at higher latitudes. While it would be naive to suggest that this represented the "primitive" condition for habitat preference in the Paridae, the Yellow-browed Tit, which, together with the Sultan Tit, was considered by Gill and colleagues to be basal to the parid evolutionary tree (see Systematics), certainly occupies such a range of habitats. The Yellow-browed Tit lives at 2000–4000 m and is a bird of temperate montane and submontane forests, mostly of oak and or rhododendron (*Rhododendron*), but then moving through mixed forests into conifer forest at higher altitudes, and into scrubby habitats, especially of willow (*Salix*), along the tree-line. Although typically below 2000 m, the Sultan Tit is likewise a denizen of submontane and lower-altitude montane deciduous, mixed deciduous and evergreen forests, while the Ground Tit, the extreme high-altitude representative of the other monotypic parid genus, occurs on treeless steppes at 3100–5500 m on the Tibetan plateau. Together, these three species cover most of the broad habitat types occupied by the family.

The habitat theme of high-altitude willow thicket occupied by the Yellow-browed Tit along the Himalayan tree-line is picked up strongly in the habitat descriptions of the genus *Poecile*. More broadly, *Poecile* tits and chickadees are species of damp woodland or scrub, or riverine woodland or carr; these are the typical habitats of, for example, the Marsh, Willow and Siberian Tits, the Boreal, Carolina, Chestnut-backed and Black-capped Chickadees, and the White-browed and Rusty-breasted Tits. Other high-altitude features of the *Poecile* habitat theme that are frequently represented are birch (*Betula*) and alder (*Alnus*) in addition to willow, which are characteristic of the habitats of most of the nine species just listed, and an admixture or pure stands of conifers, some component of which occurs in the habitat preference of all *Poecile* species, including those in drier, more southerly latitudes, such as the Mexican Chickadee and the Sombre Tit. A further important feature for many *Poecile* species is the presence of dead trees, stumps or "snags" in which to nest, and this may impose a significant limitation on the occurrence and/or population dynamics of these species. For spe-





Most tits gather, at least occasionally, in either mixed-species or single-species flocks. Flocks often form in cold weather because foraging as a group improves both foraging efficiency and predator detection, and in many regions parids are nuclear species of these flocks. On other occasions flocks form during mass movements. Parids are amongst the most sedentary of birds, but some species, including the **Willow Tit**, undergo periodic population eruptions. These individuals may be taking part in such a movement after a failure of the Scandinavian beech mast or pine seed crops.

[*Poecile montanus borealis*,  
Hanko Bird Observatory,  
Finland.  
Photo: Dick Forsman]

cies such as the Willow Tit and the Carolina Chickadee, which excavate their own nest-holes (see Breeding), the presence of soft, damp dead wood probably facilitates nesting. Nest-sites in dead wood, however, are described also for several species which do not excavate their own nest-chamber, such as the Siberian Tit. Interestingly, the latter's nearest relative, the very similar Boreal Chickadee, does excavate.

Nowhere is the importance of conifers as a habitat theme as prominent as it is for the seven members of the genus *Periparus*. Three of these, the Black-breasted, Spot-winged and Coal Tits, are true conifer specialists, two others, the Yellow-bellied and Elegant Tits, favour evergreen and mixed forests, which include conifers, and one, the Palawan Tit, is a bird of diverse forest types including secondary forest, edges of swamps and submontane regions. Only one, the Rufous-vented Tit, is an inhabitant chiefly of broadleaf, deciduous forests, especially of oak, although even this species can occur in mixed forest with a high proportion of conifers in the stand. In this, it contrasts sharply with the larger Black-breasted Tit, with which it forms a superspecies. Both occur at very high altitude, around 2000–4000 m, and, although their ranges overlap, the Rufous-vented Tit has a more easterly distribution. Also characteristic of *Periparus* is the preference for full-height mature forest: these are perhaps the most truly forest-loving tits. As was noted before for the Great Tit, *Periparus* species likewise may occur in other habitats. Coal Tits, for example, especially in years of high population density, breed at a low density of about one pair per 10 ha in oak woodland, although often in association with a single mature conifer, but their breeding success is typically poorer in broadleaf habitats; in conifer forest, *Periparus* tits often breed at high density.

Consistent with their general preference for conifer forest is the fact that the *Periparus* species are the most uniformly fine-billed of the parids. The two *Lophophanes* species, the European Crested and Grey-crested Tits, are similarly fine-billed and exhibit some preference for conifer forest, although this differs among populations. Northern populations of the European Crested Tit are conifer specialists. In Britain, for example, this species is restricted to the Scots pine (*Pinus sylvestris*) of the Caledonian

forest of Scotland. In central and southern Europe, however, it occurs in a wider range of habitats, including broadleaf woodland. Farther south also, it tends to live at higher altitudes. The Grey-crested Tit is a bird of very high-altitude forests, but it occurs in a wide range of broadleaf, mixed and conifer forests. Unlike the fine-billed *Periparus* species, which do not excavate their own nest-chambers, the two *Lophophanes* tits do excavate, and the need for dead wood imposed by this may place a constraint on the type of habitat most suitable for them.

As already noted, the *Baeolophus* titmice share a number of characteristics with the preceding genera, which may have bearing on their habitat preferences. Lack noted that the geographical distributions of three of the *Baeolophus* species, which constitute the "tufted titmouse" superspecies, formed a mosaic pattern of more or less non-overlapping ranges. These three were the Tufted Titmouse in the eastern USA, the Black-crested Titmouse in Texas and northern Mexico, and the Plain Titmouse in the western USA. The last-mentioned was subsequently split into two species, the Oak Titmouse and the Juniper Titmouse, on genetic, morphological, geographical and ecological, largely habitat, grounds. Whereas the Oak Titmouse is found primarily in oak or oak-pine woodlands of the Pacific slope, the Juniper Titmouse inhabits juniper (*Juniperus*) and piñon-juniper woodlands of the inter-mountain region. As Lack suggested, however, the members of this superspecies are chiefly birds of broadleaf woods. The habitat of the remaining member of the genus, the Bridled Titmouse, is similar, but, where this species does overlap in range with any of the three tufted titmice, it occupies a distinct foraging niche because of its much smaller size. As with the other seed-hoarding parids, riparian habitats may feature prominently within the ranges of *Baeolophus*.

*Parus* is a rather disparate genus, containing some important superspecies groupings. As such, *Parus* species occur in practically every Old World habitat in which the family can be found. In Africa south of the Sahara, tits are typically birds of savanna, from open park savannas to wooded savannas, including various kinds of acacia (*Acacia*) savanna and woodland, thornbush, dry mopane (*Colophospermum mopane*) thicket, and miombo wood-

Parids are energetic and boisterous. With their constant movement, cheerful call notes, and conspicuous antics, they are amongst the most popular of garden birds.

As it happens, many of their antics are not so much playful, as competitive. There are complex dominance hierarchies between and within parid species, and these come to the fore when conditions are harsh and food supply limited. At such times contests over food are commonplace, but usually settled with a minimum of fuss via brief agonistic displays. Typically, a dominant bird will make a forward lunge, with wings outstretched and bill open, and a subordinate bird will concede defeat by flying to a nearby perch. This system avoids escalated battles and saves much time and energy.

The **Great Tit** is dominant over other tits in Europe, and uses the same type of display to dislodge several other passerine species—in this case a female **Common Chaffinch** (*Fringilla coelebs*).

[*Parus major newtoni*,  
Sussex, England.  
Photo: Maurice Walker/  
FLPA]





land. As noted already, members of a superspecies are ecologically isolated largely because of their non-overlapping geographical ranges. Specific cases of habitat avoidance, apparently through intrageneric competitive exclusion, are also recorded. For example, the Rufous-bellied Tit, which occurs in mature miombo woodland and savanna habitats with the Miombo Tit, though occupying a slightly different niche, appears to be avoided by Southern Black Tits, which are found in miombo woodland only where the Rufous-bellied Tit is absent. A few African species extend into the savanna edge of the rainforest zone, into riparian thicket, woodland or forest, or into gallery forest: examples are the White-shouldered Black Tit in north-central Africa; the White-winged Black Tit in south-central Africa; the White-bellied and Red-throated Tits, generally not together, in east-central Africa; and the Dusky Tit in central Africa. The presence of water is important also to the Somali Tit, and the Ashy and Grey Tits of southern Africa tend to be associated with dry river courses. A specific association with montane forest habitats including juniper woods, dry *Podocarpus* forest, montane evergreen forest, highland *Hagenia* forest, primary and secondary evergreen forests and tree-heath is exhibited also by the White-shouldered Black, White-winged Black, White-bellied, White-backed Black and Stripe-breasted Tits. As with other *Parus* species, none of these excavates its own nest-hole. This, together with the facts that most of these species occur at very low densities, and that some are known to be co-operative breeders and to reuse nest-holes in successive years, suggests that the availability of nest-sites may be limiting to the populations of these species, especially in the dry thornbush habitats.

The remaining eight *Parus* species collectively occupy practically every vegetated habitat of the Palearctic and Oriental Regions, and illustrate well the principles of niche separation within or between habitats or ranges. The Great Tit, the single most varied and widespread parid in the world, occurs in every kind of forest, scrub or bushy habitat, and in both primary and secondary forest, and it is the only member of the family specifically associated with mangroves in a part of its range. Generally, it thrives best in broadleaf forest, although it tends to prefer conifer forest in areas where the Green-backed Tit is present. The Great Tit is, however, largely a lowland species, rarely occurring above 2000 m. Habitat use by the very closely related Turkestan Tit is similar, but the ranges of the two species overlap little; where they

do, the species may interbreed, and they were formerly considered to be conspecific. The similar, but smaller, Green-backed Tit avoids competition with the Great Tit generally by living at higher altitude, up to about 4000 m. South of the Himalayas, the White-naped Tit now occurs in dry acacia thorn-scrub, recalling the major habitats of the African *Parus*, although formerly it was found in south-west India mostly in moist deciduous forest. The Black-lored and Yellow-cheeked Tits, a sibling pair the ranges of which barely overlap, occupy a wide range of forest habitats, including submontane and montane, temperate and subtropical, deciduous or mixed, forests, but generally with oak, pine and rhododendron present.

This survey of parid habitats has hitherto focused on breeding habitat. Outside the breeding season, many of the species occur in a wider range of habitats. This may be because of a shift in diet from invertebrates in summer to seeds in winter, which dictates that a habitat shift is necessary; one example of this concerns the Great Tit, which in Europe forages extensively in beech (*Fagus sylvaticus*) for seeds in the winter months, but for which beech woods represent poor breeding habitat. Alternatively, it may be because of population pressure caused by the increase in bird density after breeding, which, through competition, pushes subordinate individuals into suboptimal secondary habitat, generally scrubby rather than wooded. Such a situation is apparent for many species, among others the Marsh Tit, the Black-capped Chickadee and the Yellow-bellied Tit, but the real extent and importance of this kind of dispersal are shown by the occurrence of parids in anthropogenic habitats such as cultivation, orchards, olive groves, parks and gardens. Of the 56 members of the family, no fewer than 30 have been recorded in anthropogenic habitats, including members of all genera except *Pseudopodoces*, in all zoogeographical regions where parids occur. Of these 30, as many as 23, or 77%, have been recorded in parks and/or gardens, where many of them come for food purposefully provided by humans. The other seven species may occur in such places as orchards or olive groves, or at the edge of or on cultivated land, at some time during the year; eleven of the 30 are recorded only in parks or gardens, and a further twelve species are associated with both garden-type and cultivation-type habitats. In most cases, these species either do not breed in anthropogenic habitats, or do so at lower densities and with poorer success than is the case in their primary habitats.



The **Ground Tit** is often found in pairs or small groups. It skims low to the ground on fluttering wingbeats, bobs on alighting, and proceeds with long hops across open ground. Individuals frequently flick the wings and tail, and display with wings held high, as depicted here. These habits are strikingly different from those of arboreal tits, and more similar to a variety of other ground-dwelling groups, such as wheatears (*Oenanthe*) or Cinclodes (*Cinclodes*), emphasizing the fact that signalling displays are shaped by ecology as well as phylogeny.

[*Pseudopodoces humilis*, Litang, Sichuan, China. Photo: Christian Artuso]

Comfort behaviour in parids involves a range of typical strategies. All members of the family commonly preen, often shortly after bathing. Preening is undertaken using the bill, with frequent applications of oil from large uropygial gland. It is also usually interspersed with bouts of wing-stretching, as demonstrated by this juvenile **Rusty-breasted Tit**, and head-scratching, which can be achieved either directly or indirectly (over the wing).

[*Poecile davidi*,  
Jiuzhiagou,  
Sichuan, China.  
Photo: John & Jermi  
Holmes]



The significance of gardens and other artificial habitats is highlighted by studies of habitat fragmentation, for which parids have been critically important because of their ubiquity and relative ease of study. Forest fragmentation has a number of major effects on the ecology of tits: it isolates parts of otherwise continuous populations, potentially reducing gene flow between them; it may increase the energy costs incurred by the birds in crossing areas of unsuitable habitat; it can increase the birds' exposure to predation risk; and it may reduce breeding success and individual condition because prey densities have been found to be lower in small woodland fragments compared with continuous blocks of woodland. For example, a British study found that the breeding performance of Great Tits and Common Blue Tits declined with decreasing size of woodland area. For the latter species, this was because pairs in smaller woods bred later, when food was less abundant. In addition to this effect, Great Tits reared lighter young in smaller woods. The effect of woodland size on laying date was substantial, accounting for 25% of the variation in laying date of Great Tits and 33% in the case of Common Blue Tits. In another British study, the breeding success of Great Tits was reported as being poorer in gardens than in scrub, which itself was poorer than in a large woodland block. In a Belgian study, it was found that local recruitment of Great and Common Blue Tits to the breeding population was greater in large woodland plots than in small ones. Local recruitment was higher in forest fragments than in similar-sized plots within continuous forest, suggesting that fragmentation reduced the movement of birds among local populations; it appeared not, however, to be related to the degree of isolation of individual fragments. In a different Belgian study, European Crested Tits hatched in woodland fragments were found to have a lower chance of settling in their preferred habitat, because they tended to disperse later than did young from larger woodlands. Other studies suggest that forest fragments do not always provide poorer feeding conditions than those in larger patches. A further effect of "hard" edges of forest fragments is that, outside the breeding season, tit flocks may tend to follow the edges, rather than foraging within the forest interior. This has been observed for chickadee flocks in Canada, and suggested a reluctance on the part of the birds to move between woodlots. Whether this tendency increased the risk of predation is not known.

The importance of the Paridae in research on habitat fragmentation is further indicated by two recent studies of Great Tit populations, one in Britain and the other in the Netherlands. Both in Wytham Woods, a continuous block of woodland in southern England, and on the Dutch island of Vlieland, it was found that variation in habitat quality within one and the same site can restrict the movement of individuals, and thus gene flow, sufficiently to cause differential evolution in different parts of the same population.

### General Habits

The relative ubiquity of the Paridae in the Northern Hemisphere, coupled with their naturally inquisitive nature and willingness to associate with humans, results in their general habits seeming very familiar, even commonplace, to most people there. In general, parids are highly active birds, busily inspecting foliage and branches in search of food. They are generally territorial when breeding, and they are social when not breeding, at which time they form single-species groups and/or join other species, of both Paridae and others, to form mixed-species flocks. They declare or advertise their territories by song, and they defend them by a hierarchy of escalating facets of behaviour, ranging from song and display, involving specific plumage badges and advertising postures, to chasing and fighting. All parids are hole-nesters, a fact which distinguishes them from some of their closest relatives, such as the penduline tits and the long-tailed tits. Parids, especially paired adults, may form the nucleus of non-breeding flocks, but often that is provided by members of another family, such as the Long-tailed Tit (*Aegithalos caedatus*) in Europe. The composition of flocks varies through the year, in terms both of the species joining the flocks and of the very individuals within a species that join. It is not unusual, for example, for adult male Great Tits to continue to sing on their territories through the winter, while also spending time each day in foraging with a flock up to 1 km away.

For a number of Holarctic parid species, the behavioural aspect of flocking has been studied in detail. The advantages of flocking are two-fold: predator detection on the one hand and, on





Tits, like most woodland passerines, are fond of bathing. They prefer to undertake this activity on the secluded, gently sloping shores of ponds or streams. After landing belly-deep in shallow water, they briefly duck the chest under the surface. Then follows a period of variable length during which they flutter their wings energetically, usually alternating from side to side, as demonstrated by this **Carolina Chickadee**. This species is common in the south-east USA, intergrading in a narrow hybrid zone with its close relative the Black-capped Chickadee (*Poecile atricapillus*), which replaces it to the west and north.

[*Poecile carolinensis* extimus,  
Hamilton County,  
Ohio, USA.  
Photo: Dave Maslowski/  
Maslowski Productions]

the other, foraging enhancement. Put simply, a group of birds is more likely to detect a predator than is a single individual, and individuals learn the whereabouts of the best places at which to seek food by watching other flock-members. A trade-off or tension between these two functions is, however, evident. This is because, while there is an advantage in foraging with conspecifics in terms of learning where to forage, there is more competition for that food with conspecifics occupying the same niches than when foraging with members of other species, which can also detect predators. Mixed-species flocks, however, can function well in terms of mutual predator avoidance only if every individual in the flock "speaks the same language". In this regard, it is noteworthy how similar are the alarm calls of parids even across vast distances. This is demonstrated by comparing, for example, the social calls of the Bridled Titmouse in the south USA with those of the Common Blue Tit in Europe (see Voice).

With much of the annual cycle, the precise details, and especially the timing, of events vary with climatic conditions, but a general pattern of the parid year is as follows. After a variable period of territory establishment and defence, breeding takes place in spring, typically during April–June in north temperate regions and January–June in more southerly areas of the Northern Hemisphere, and in August–December in the Southern Hemisphere. Breeding is followed by the formation of family flocks with dependent young, which coalesce into monospecific non-family flocks and/or mixed-species flocks. The moult occurs after breeding. Winter flocks break up in the early spring, when males increasingly establish breeding territories. Flocking results in copious opportunities for intraspecific and interspecific agonistic interaction, especially in relation to social dominance and access to food. This has important consequences for the tits' management of energy reserves, their survival prospects and so on. It has probably also contributed to the evolution of parid intelligence, the tits being, together with two other highly social avian groups, the parrots (Psittacidae) and the corvids, among the most intelligent of all birds (see Food and Feeding).

While the outline given above is broadly applicable to all parids, there are important differences of detail among species. Ultimately, these differences appear to be driven by a suite of correlated behavioural and ecological factors, including social dominance, population density, and mortality rate or risk. Hence,

one can perceive a continuum of variation from "pair-territorial" species that remain paired for life and remain on their territory throughout the year, these including several *Poecile* species, the European Crested Tit and the Oak Titmouse, through to "group-territorial" species, in which the stable pair, having bred, forms a nucleus, sometimes with another adult pair, for a small stable flock, typically with one or a few juvenile pairs. This latter form of social organization, which appears to be by far the most common in the Paridae, again includes many *Poecile* species, such as Varied, Willow and Marsh Tits and Black-capped and Mountain Chickadees, and also the European Crested Tit, the Bridled Titmouse and the Southern Black Tit. The stable flock may defend



Whether they are foraging in mixed-species flocks in midwinter, or announcing territory ownership in spring, tits are noisy birds. Many species give incessant contact calls when foraging, and most have distinctively metallic or nasal songs, heavy on rhythm and light on melody. The **Chestnut-backed Chickadee** is no exception, having a song made up of repetitions of the call notes, some sweet and some churring. Being oscines, parids develop their songs through an imprinting-like process which produces repertoires, dialects and individual variation.

[*Poecile rufescens* rufescens,  
Portland, Oregon, USA.  
Photo: Arthur Morris/  
Birds as Art]



The typical parid foraging niche is that of a generalist. All members of the family eat invertebrates, but many, especially those living at high altitudes or latitudes, switch seasonally to a diet of seeds and fruit. The smaller species, such as the **Common Blue Tit**, are well known for their technique of hanging by one or both legs, upside-down, to inspect foliage, branches or, as in this case, pine cones for food. Whether this individual is currently searching for nuts or insects is difficult to say, as both items are taken opportunistically.

[*Cyanistes caeruleus*  
*caeruleus*,  
Holstebro, Denmark.  
Photo: Hanne & Jens  
Eriksen]



its collective home range against members of other such flocks, but the pairs within the group do not defend territory within that range. At the farther end of the continuum are the true flocking species, including the Great Tit, the Common Blue Tit and the Coal Tit, breeding partners of which may remain paired through the winter and form a nucleus for a flock, but the composition of that flock varies over time. It can be more or less constant and consist of a few juveniles associating with the adult pair, in which case this "basic flock" may appear similar to the organization of the group-territorial species; alternatively, it can be a wholly random assortment of other conspecifics, their membership of one or another flock changing from day to day, and the flocks' home ranges may overlap.

It will be apparent that this "gradient" of socialization, which is effectively a continuum of social cohesion in terms of group membership, varies across genera. While this is broadly true, one should, however, note that different populations of a given species fall into more than one group, as illustrated by, for example, the Varied, Willow and Marsh Tits and the European Crested Tit, indicating that social organization responds to local ecological conditions, rather than to specific genetic tendencies. The pattern should therefore be perceived as being far more flexible; it would be wrong to think of this variation simply as a taxonomic distinction. This broad continuum, however, parallels a number of other trends. The pair-territorial and group-territorial species tend to be more socially subdominant when in mixed-species flocks, especially when with such flocking species as *Parus* or *Cyanistes* tits; they tend also to scatter-hoard food such as seeds, whereas flocking species tend not to, although the Coal Tit is an exception among the latter. Compared with flocking species, pair-territorial and group-territorial species tend to occupy larger territories and to breed at lower density, but to have more stable populations over time: this is especially true of chickadee populations, which have been reported as being highly stable over several decades. Perhaps related to this is the fact that they tend to experience lower annual adult mortality, typically 30–50%, compared with 50–70% for flocking species.

Pair-territorial and group-territorial species are more likely to excavate their own nest-hole, and may also be co-operative breeders. Here, perhaps, is the most significant departure from a strict taxonomic classification and towards an ecological one,

because many of the African *Parus* tits are, or are believed to be, co-operatively breeding pair-territorial or group-territorial species. Relating to these gradients also is the duration of juvenile dependency, or the period until juveniles leave the natal territory, which is longest among group-territorial species. In the case of the Varied Tit, a species which may also be a facultative co-operative breeder, it may be as long as three months.

A distinction should be made between the various kinds of flocks described herein and the aggregation of birds at a temporarily available food source. The composition of an aggregation can differ totally from that observed in stable or basic flocks. For example, while the number of parid conspecifics in a true flock would rarely exceed ten and would have a more or less predictable age structure, aggregations of up to 100, mostly first-year, Great Tits feeding on beech mast are not uncommon in England, and all-adult flocks of 40 Great Tits have been trapped while feeding on yew (*Taxus baccata*) seeds in Killybegny, in the Republic of Ireland. Within these Great Tit aggregations, there is typically a high frequency of interactions in which, for example, an individual with a seed is supplanted by another. In these situations, as in most parid flocks that have been studied, males outrank females and, within sexes, adults outrank juveniles or first-year individuals; this may differ in group-territorial species, in which females of the alpha pair outrank all except the alpha male. Hence, it has been noted that, as the beech crop becomes depleted through the winter, it is the most subordinate individuals that are the first to leave; the last to depart are adult males.

Another feature running alongside the gradient of social organization is that of plumage contrast, or, more specifically, of "badging". Badges of dominance, or fitness-coloration, include bills, eyebrows and wingbars. Whereas the most pair-territorial parid, the Coal Tit, has the least developed of these, in terms of badges of dominance, the most extreme of the flocking species, namely the Great Tit and the Common Blue Tit, are positively "badging" with badges indicating age, sex, nutritional status, and often, The correlation between plumage badges and agonistic interaction is likely to be a real functional one. It has been noted that, within pair-territorial and group-territorial species, the frequency and intensity of intraspecific agonistic interactions are much less than those within flocking species. In the latter, flocking behaviour itself is weather-dependent, in





Although food-caching has not been reported for the **Yellow-bellied Tit**, it is known in several other members of the *Periparus* clade. While this individual may be foraging on the ground, a not unusual event in some parids, it is perhaps more likely that it is carrying a seed to a cache, or indeed retrieving it. The main food-caching tits are in *Periparus* and *Poecile*, some of which cache hundreds of thousands of items per year, and are known to retrieve up to 95% of their caches. The recall necessary to achieve this feat is quite astounding, and presumably contributes to the evolution of parid intelligence.

[*Periparus venustulus*, Lam Tsuen, Hong Kong. Photo: John & Jemi Holmes]

that members of non-stable flocks are more likely to join flocks when conditions are hard. This has been described also for the Varied Tit, which tends to join mixed-species flocks in tougher weather, or when not fed by humans, though when conditions are milder, or food is provided, Varied Tits form only single-species groups. This is because the increased need to find food reduces the time available for vigilance, and the only way in which to reduce individual vigilance safely is to share the task in a flock. Variability in flocking behaviour resulting from day-to-day changes in ambient temperature means, however, that the individuals comprising a flock on one day may not be the same as those present on another day. One result is that, unlike the situation with the pair-territorial or group-territorial species, in which individuals "know" each other and clear dominance hierarchies are well established, such hierarchies cannot be so clearly based on previous experience in flocking species. If birds do not recognize each other as individuals, the generalized conventions of social dominance, based on such factors as sex and age, must be indicated by some other means, such as plumage. Nevertheless, dominance ranks among many Great Tits have been shown to be stable throughout a winter, with high-, middle- and low-ranking individuals constantly so placed.

Whether through appearance, convention or trial, tit species within mixed parid flocks also have a more or less stable rank in the flock. In Europe, the typical situation is that Great Tits outrank Common Blue Tits, which outrank Marsh Tits, which are dominant over Willow Tits, which usually outrank Coal Tits. European Crested Tits, when present, slot into this sequence after Common Blue Tits, and the presence of Siberian Tits influences the hoarding sites used by Willow Tits. Similarly, in North America, the Tufted Titmouse, the largest parid in the Nearctic, is dominant over all other species at birdfeeders. The most demonstrative way in which these rankings are manifested is in shifts in a species' foraging location in the presence of a higher-ranking species (see Food and Feeding).

It is interesting to note here how relatively lacking in badges are the African black tits, namely the Southern Black, Carp's Black, White-winged Black and White-shouldered Black Tits, the social organization of which appears more similar to that of most *Poecile* and *Baeolophus* species than is that of the flocking

*Parus* species of the Palearctic and Oriental Regions. Unfortunately, the social organization of most of the African grey-tit group, consisting of the Somali, Miombo, Ashy and Grey Tits, is largely unknown. It has been argued that co-operative breeding by the tits of southern Africa has evolved because a significant anti-predator advantage is obtained from group-living in the savanna in any season. Coupled with the low densities of these species, with territories of up to 30 ha for a single pair, presumably because of a paucity of nest-sites, and a low reproductive rate, with clutches typically of fewer than five eggs, this means that it is beneficial for individuals that cannot find a mate of their own to remain in a group, helping to raise young of the alpha pair, than to wander as "floaters" in the hope of finding an unpaired conspecific. A similar reasoning may underlie the group-territoriality and co-operative breeding practised by some *Baeolophus* titmice.

Supporting the suggestion that, among the Paridae, plumage badges and elaboration have co-evolved as a package with social organization is the relative lack of contrast in the plumage of the Azure Tit. This species' life in the boreal forests of Siberia imposes on it a low breeding density and probably also a necessity to maintain stable flocks, as this is one of very few parid species known regularly to roost communally, another such being the White-bellied Tit of the Afrotropics. When not breeding, the Azure Tit is typically seen in pairs or small flocks, suggesting that its social organization may be more like that of a *Poecile* tit than that of its nearest congener. In the winter months, most parid species roost singly in holes in trees or in rodent burrows in the ground; in summer, they often roost on a branch near the tree trunk. Most members of the family living in the boreal zone belong to the genus *Poecile*. These northern tits, in addition to hole-roosting, become hypothermic, reducing their body temperatures by 5–12°C and, thus, lowering also their metabolic rate and energy consumption. This has been recorded for at least four *Poecile* species, these being the Willow and Siberian Tits and the Carolina and Black-capped Chickadees. Perhaps *Cyanistes* species cannot do this.

Parids undertake various types of maintenance and comfort behaviour. They use the bill when preening, for which purpose they possess a large uropygial gland. They also carry out both



A **Tufted Titmouse** uses its innate agility to extract food items from difficult locations. Once it has removed a sunflower seed from the head of a sunflower, it uses its bill to manipulate the husk, and break out the kernel. The same technique is more or less repeated throughout the family. Titmouse bills are small, but very powerful, and they are capable of giving a painful nip. The same is true of most parids, although conifer specialists, such as *Periparus*, tend to have much finer bills.

[*Baeolophus bicolor*, Hamilton County, Ohio, USA.

Photo: Dave Maslowski/Maslowski Productions]



direct and indirect scratching. Some members of the family have been observed to indulge in passive anting, in which they squat and allow ants to run over them.

## Voice

Being highly social species, the tits and chickadees are among the most vocal of passerines, frequently issuing quiet contact calls while foraging, even when apparently solitary, but also giving a range of louder calls, which are more or less context-dependent. Indeed, so rarely are parids silent that, when they are, that silence itself is context-dependent, being indicative of, for example, a male avoiding detection by a territory-holder, or of the presence of a predator. Before DNA analysis offered some resolution to the systematics of the Paridae (see Systematics), attempts were made to reach a natural classification on the basis of vocalizations. That this might be possible was suggested especially by the commonality of calls, such as, in particular, the “chick-a-dee-dee”-type calls and “fee-bay” or “see-bay” types of song produced by most *Poecile* species, especially in the Nearctic and the western Palearctic, which in the former region give them their vernacular name of “chickadee”. Closer examination, however, even simply of the voice descriptions presented in field guides, indicates that calls and songs of the Paridae cross generic boundaries in the same way as do such plumage features as wingbars (see Morphological Aspects). Hence, the familiar “teacher-teacher” song of the Great Tit, the Turkestan Tit and other *Parus* species, in both Asia, as typified by the Yellow-checked and Yellow Tits, and Africa, as by the White-winged Black and Stripe-breasted Tits, is produced also by a *Poecile* species, the Sombre Tit, by a *Periparus* species, the Elegant Tit, and by *Cyanistes* species in regions where the Great Tit is absent, as by the Common Blue Tit in north Africa and by the Canary Blue Tit; songs reminiscent of the Great Tit’s are produced by other *Periparus* species, in addition to the Elegant Tit, one example being the “teehuu, teechuu” song of the Coal Tit. Similarly, the explosive “pichou” call usually associated with *Poecile* species, such as the Marsh Tit, has been recorded from the Great Tit, the Elegant Tit and the Common Blue Tit, in the respective genera *Parus*,

*Periparus* and *Cyanistes*, while the nasal “eez-eez-eez”-type calls most typical of *Poecile*, such as the Willow Tit, are sometimes given also by *Parus*, such as the Red-throated and White-bellied Tits in Africa, as well as by the Black-crested Titmouse in the genus *Baeolophus* and by two *Periparus* species, namely the Coal Tit and the Elegant Tit. Even the “chick-a-dee-dee” motif of *Poecile* is recalled in the “tsi-tsi-chay-chay-chay” of the Somali Tit. Moving even farther apart, both geographically and genetically, the “churr” call of the Bridled Titmouse, a *Baeolophus* species, is remarkably similar to that of the Common Blue Tit, though the common ancestor of these two must be very ancient.

The reasons for the failure of vocalizations to parallel phylogeny are similar to those that cause plumage patterns to fail



[*Baeolophus ridgwayi*,  
ridgwayi,  
Arizona, USA.  
Photo: Roland Seitre]

To kill invertebrates or to extract seeds from tough husks, some parids use a technique called “hold-hammering”. This is most common in the stubby-billed genera, such as *Parus*, *Poecile*, *Cyanistes* and *Baeolophus*. Food items are held with the feet (caterpillars or similar prey under one foot, seeds between both feet), and then struck repeatedly with the bill, as demonstrated by this **Juniper Titmouse**. This persistent hammering is powerful enough to crack open a hazelnut (*Corylus avellana*), although it may take 20 minutes.





During hard weather the dietary spectrum of parids widens. Species such as the **Common Blue Tit**, an inveterate hunter of caterpillars during the chick-rearing season, turn to seeds and fruit. These individuals are eating rowan (*Sorbus*) berries in the Finnish winter, but a wide variety of plant species are plundered, including figs (*Ficus*), mistletoe (*Viscum*), and blackberry (*Rubus*). In spring, the Common Blue Tit also forages on sap taken from the bark of trees such as sycamore, maple and walnut, and it is sometimes noted gleaning nectar from flowering trees, including willow, plum and cherry.

[*Cyanistes caeruleus caeruleus*.]

Above: Anjalankiski, Finland.

Below: Helsinki, Finland.  
Photos: Markus Varesvuo]

The **Mountain Chickadee** forages actively in the middle to lower levels of trees, searching trunks and branches, gleaning from foliage and needle clusters, and occasionally descending to the ground. This individual has been using its feet to hold an object steady while extracting food items with the bill, a common tactic in the Paridae. In this case the target is leaf buds, a popular food item during the late winter months, along with conifer seeds and berries. This species stores seeds throughout the year, and retrieves them during the winter.

[*Poecile gambeli gambeli*,  
Grand Mesa  
National Forest,  
Colorado, USA.  
Photo: Andy & Gill Swash]



systematically. In other words, while there is a certain evolutionary inertia – and, in cases such as the chickadee alarm calls, this itself is adaptive in permitting interspecific communication in mixed-species flocks – the properties of vocalizations are equally adaptive in that they are optimized for particular habitats. As a result, the vocal patterns throughout the family exhibit interspecific similarity both through common ancestry, or homology, and through convergence, or analogy.

With this in mind, a survey of vocalization is most usefully viewed in terms of the occurrence of specific call motifs, rather than in relation to particular taxonomic groupings such as genera, although the generic characteristics of certain calls, especially of chickadees, should be considered also. Parid calls range from quiet “see-see-see”, “tsi-si-si” or “si-si-si” notes, through soft to harsh “chrrrrr” notes, to more or less explosive (literally, plosive) “pitchoo”-type calls. Call-note repetition, such as “si-si-si”, rather than just “si”, is frequent among the Paridae, and the number of repeated elements may indicate the intensity of expression. For example, the “chic-a-dee-dee” calls of Nearctic *Poecile* species are used as a means of signalling alarm, and field experiments with stuffed predators have demonstrated that the number of “dee” elements increases with the perceived level of threat. Moreover, this is a reliable indicator of threat, or of the true risk, since smaller predators, such as small owls (Strigiformes), that prey on chickadees elicit a stronger response, with more “dee” notes, than do large, fiercer-looking predators that rarely prey on chickadees, such as large owls. Single, quiet, “sip”-type calls appear common to most parids, and are probably used in order to maintain flock cohesion, as contact calls. A prolonged high-pitched “seeeee” is uttered by many bird species, including non-parids, to signify the possible presence of a predator, usually an avian one, the exact position of which is unknown. This avian-predator alarm is adaptive, because its caller is difficult to locate, or it even appears to be ventriloquial. Expanding of the “sip” call in terms of numbers of elements to “see-see-see”, “sip-sip-sip”, “tsee-see-see” or “tsip-see-see-see”, and so on, appears to signify mild alarm in nine species of *Poecile*, five *Periparus* species, both of the *Lophophanes* crested tits, four of the five *Baeolophus* titmice, 16 *Parus* tits, the Common Blue Tit and Azure Tit in *Cyanistes*, and the Yellow-browed Tit in the monotypic genus *Sylviparus*.

A “tsee” or “tsi” note may often prefix more complex motifs, as in the “tsi-tsi-chacha” motif of the Southern Black Tit. Phrases similar to this are given by many other African *Parus*, including, for example, “tsi-tsi-tsi-er-er-er...” by Carp’s Black Tit, “si-chah-chah-chah” by the White-bellied Tit, “tsi-za-za-za-za” by the White-backed Black Tit, “tsitsi-chaa-chaa-chaa-chaa” by the Rufous-bellied Tit, “tsi-tsi-de-de-de-de-de” by the Somali Tit, “sisisisi-cha-cha-cha” by the Ashy Tit and “tsi-cha-cha-cha” by the Grey Tit. Given the necessary presence of a human observer when these calls were recorded, it is likely that they have a similar warning function to the “chick-a-dee-dee” call of *Poecile*. An extension of these polysyllabic calls, as it consists of a number of rapidly repeated elements, is the more or less scolding churring call, often, as with the Common Blue Tit, rising in frequency; this is a familiar utterance from *Cyanistes* and *Lophophanes* in Europe, *Baeolophus* in the Nearctic, and *Parus* in Europe, Africa and Asia. This churring call, too, appears to be a signal of mild alarm, and the degree to which the frequency is modulated through the call appears to signify the degree of alarm. As with the “chick-a-dee-dee” calls, it is delivered in response to a perceived threat of known location. That so many calls have been recorded in connection with situations of threat or alarm may be due to a bias in the commonly heard vocalizations, since an observer must have been present and may have been perceived as a threat. This raises the question of whether any calls exist for other situations but have not yet been documented. Perhaps in support of this is the suggestion that any unfamiliar call in a British wood, heard by a reasonably experienced birdwatcher, is likely to emanate from a Great Tit; the present author’s experience in more than 25 years of studying this species would tend to corroborate this.

The “chick-a-dee-dee” calls, and the similar counterparts given by *Parus* tits, mentioned above, recall the begging calls of the chicks of many parid species. While very young chicks either are silent or emit quiet sibilant or slightly metallic “tsee-see-see” calls, after a week to ten days the nestlings are large enough to produce loud “dee-dee-dee-dee” calls, which make the brood vulnerable to predators. Many other vocalizations are, as these, specific to the breeding season. For example, “zeedling”, which has been described as given by both Great Tits and Common Blue Tits, is a specific high-pitched call uttered during courtship feeding and, sometimes, during copulation. Females defending





Parids are essentially insectivorous birds, although in temperate environments they are more or less adapted for a seasonal switch to seeds and fruit. The **Coal Tit**, along with its congeners in *Pariparus*, tends to consume a higher proportion of insects in the diet. Like most conifer specialists in the family, this species is relatively fine-billed, an adaptation for picking prey items from amongst conifer needles and manipulating small-bodied invertebrates, in this case a spider. The proportion of different food items in the diet, particularly at the level of prey species, is determined largely by the availability and seasonal abundance of each item.

[*Pariparus ater cypristes*, Troodos Mountains, Cyprus.  
Photo: Michael Gore]

the nest have been recorded as giving a snake-like hiss, this having been heard from, for example, the Sombre, Marsh and Siberian Tits, the Spot-winged and Coal Tits, the Great Tit and the Common Blue Tit; the hiss may be accompanied by a wing-flick and fanning of the tail, the combined effect of which can be quite startling. With the Coal Tit, such snake-hiss defensive calls may be given also by feathered young.

Song is, of course, the vocalization most closely associated with breeding, and that which has attracted the most research interest. As with the greater part of research on this family, however, there is a very strong bias towards the Great Tit. Experiments have demonstrated that parid song has, in addition to its mate-attracting functions, a very strong territorial function. Further, and as may be predicted from social organization (see General Habits), song seems to be most complex and strident in the flocking species, less so in the group-territorial ones, and least so in pair-territorial species, the songs of which consist of repeated, even monotonous, series of notes or simple syllables. Nevertheless, song is delivered well in advance of breeding, even by the last-mentioned species, suggesting that it has a significant advertising function. That this, like the "dee-dee-dee" calls of chicks, perhaps represents a more primitive song condition in the Paridae may be suggested by the simple songs of the Yellow-browed Tit, which sings "piu-piu-piu-piu" or "tiu-tiu-tiu", and the DNA of which places it basally to the parid phylogeny (see Systematics). Song may be delivered at any time of the day, but during the breeding season it is especially concentrated during the dawn chorus, when the sound-transmission quality of the air is best. At this time of year it is especially related also to the female's most fertile period, thus being associated with mate-guarding, as shown for the Great Tit and Willow Tit.

Simple repetitive songs of this kind occur throughout the family, but they are particularly common in the genus *Poecile*. Examples of songs given by species in the latter genus are the "tsiu-tiu-tiu-tiu" of the Marsh Tit, the "piu piu piu" of the Willow Tit, the "see-bee-see-bay" of the Carolina Chickadee, the "fee'bee-bee" of the Black-capped Chickadee, the "fee-fee-fee fee-bee-bee"

of the Mountain Chickadee, the "peeta peeta peeta" of the Mexican Chickadee and "peta-peta-peta..." of the White-browed Tit, the "tsip zee zee" of the Rusty-breasted Tit, the "psiup-psiup-psiup" of the Siberian Tit, the "chip-chip-chi-chi-chi-chi-chip" of the Chestnut-backed Chickadee, and the "tsre-tsre peee-triri-peee-triri-peee-triri" of the Varied Tit. Reminiscent of these *Poecile* songs is the one typical in Europe of a *Cyanistes* tit, the Common Blue Tit, which is a descending and slightly accelerating "tsee-tsi-brree tsee-tsi-brree".

Although parid songs are typically repetitive, their quality to the human ear nevertheless varies greatly. Whereas song elements of many tit species are described as harsh, scolding or scratchy, those of several others, among them the Siberian Tit, the Coal and Elegant Tits, the Black-crested Titmouse, and the Southern Black, Ashy, Turkestan and White-naped Tits, are considered to be "mellow". Even complex song phrases are uttered by several species, such as the White-browed Tit, Yellow-bellied Tit, Elegant Tit and Ashy Tit, and the songs of the White-shouldered Black Tit are considered to have the quality of those of *Turdus* thrushes (Turdidae).

Much research on parid song, especially with regard to the Great Tit, has been concerned with its dual advertising functions of mate attraction and territory defence. While the basic song type of the Great Tit is simple, many males have a repertoire of up to eight distinct song types. Great Tits sing at about 4–6.5 KHz, and produce songs in bursts consisting of several "tea-cher, tea-cher, tea-cher" strophes punctuated by silence. The singer may then change to a different song type. A population may have more than 40 song types in any year and, in the population as a whole, no type is produced more commonly than any other. Furthermore, the song types present in the population gradually change over years as the members change. Males differ in the numbers and types of songs that they sing, and they have more song types in common with neighbouring territory-holders than they do with more distant males. They learn some common song types before they are fully independent, but others they learn from neighbours once they have established a territory. Songs can be learned

throughout life but, although the song types produced by a male may change with time as his neighbours change, males tend to replace songs previously produced. As a consequence, a male's repertoire size may increase little with age, although populations differ in the degree to which this is so. This means that Great Tit males recognize more songs than they produce.

Song-learning and the replacement of older songs allow males to sing duets with neighbours, in a process known as "song-matching". This indicates to a neighbour that he is the intended recipient of a particular song. This may explain why males with larger repertoires tend to be better at deterring intruders. Song-matching also allows males to compare the received song with that expected, and to judge the transmitter's distance by comparing the difference, which is due to frequency-degradation with distance travelled through the wood. For this reason, and since the degradation rate varies among habitats, Great Tit songs in Europe differ more in relation to habitat than in relation to geographical separation: woodland songs recorded hundreds of kilometres apart are more similar to each other than they are to songs recorded in denser forest just a few kilometres away, the latter having lower maximum frequencies, a narrower frequency range and fewer notes per strophe.

One reason why males have large repertoires may be that they become habituated to a song and, in time, come to ignore it. Although there is good evidence for this, there is also good evidence that males with larger repertoires are fitter individuals. Males which sing more songs tend to be socially dominant, to have a greater chance of breeding, and to produce more and heavier chicks, and more recruits, than do males with smaller repertoires. Great Tit males with large vocal repertoires also sing longer strophes and display less "drift", for example in frequency.

Females are able to tell much from song, which gives an honest signal of male quality. Female Great Tits treated with a female hormone to heighten their interest in male stimuli seem, however, to prefer the songs of local males over those recorded elsewhere. This complements observations that females are more likely to pair with males having songs similar to, but not the same as, their own father's songs. Since females are known to prefer to pair with local males, this suggests that they take an interest in

a male's songs not just in order to assess fitness, but also to assess how closely related they are; this would be important, as chicks produced by parents that are related to each other are, as a result of genetic difficulties, less likely to survive. Female Great Tits, too, may sing, but specifically to attract the attention of the male, for example to help her in defending the nest.

## Food and Feeding

Parids are generalist, opportunistic, invertebrate-eating birds that, outside the breeding season, incorporate, to a greater or lesser degree, seeds in the diet. Indeed, even the most aberrant member of the family, the Yellow-browed Tit, takes small seeds. The chicks are raised largely on tree-defoliating caterpillars (Lepidoptera). Naturally, the precise list of food species taken, either when breeding or at other times of the year, varies from one parid species to another, but even the most cursory inspection of the data indicates the generally catholic tastes of the tits and chickadees. This may suggest that the average parid will eat practically anything with more than four legs if small enough to handle, but this perception is profoundly flawed.

Detailed investigations of the foraging behaviour of the Great Tit, probably the species with the greatest dietary breadth, indicate that complex decision-making processes are involved in its foraging, and that generally this species follows "rules of thumb" that result in its foraging optimally in terms of energy management. For example, when foraging for prey for nestlings, Great Tits do not simply search for caterpillars, but select those caterpillars that are small enough for chicks of the particular age at that time, so that prey size increases over the brood's first six days from hatching; this is integrated with an assessment of the distance travelled from, and the time spent away from, the nest, the adults returning with larger prey as the time away from the nest increases (following the rules of the "Marginal Value Theorem" of central-place foraging).

So, apart from variation in food availability, the main constraints on parid trophic ecology stem from five factors. These are: (i) optimal-foraging rules; (ii) specific dietary requirements

In northern latitudes, parids are rarely seen drinking directly from water sources, tending to meet their needs through the water content of insects and seeds.

In more southerly climes, and drier habitats, however, they are perhaps more regular visitors to ponds and streamsides. This **Carolina Chickadee** is crouching at the edge of a shallow pool, almost certainly drinking, but also possibly collecting small pieces of calcareous grit. Both sexes eat grit to aid digestion, and breeding females seek grit and other calcareous material, such as fragments of snail shell. This helps them to form eggshells, and aids in the development of nestlings.

[*Poecile carolinensis*  
*extimus*,  
Hamilton County,  
Ohio, USA.

Photo: Dave Maslowski/  
Maslowski Productions]







Parids hang upside-down to inspect awkward locations when foraging, but when no foothold is available a further technique is used, sometimes termed "reguline" foraging, but better known as hovering. This technique is frequently used by the smaller parids, allowing them to find hidden insects on the underside of foliage on outer branches, for example, or to steal prey items from spiders' webs. The benefits of this behaviour extend beyond food. With water almost impossible to find in freezing conditions, this **Black-capped Chickadee** is hovering to quench its thirst at the tip of an icicle.

[*Poecile atricapillus*  
*practicus*,  
Freeville, New York, USA.  
Photo: Marie Read]

Most parids are socially monogamous with lifelong pair-bonds. Breeding territories are established at the beginning of each reproductive season, but the first signs of courtship are often seen earlier. A male **Chestnut-backed Chickadee** has delivered a small insect to its mate in a pre-breeding ritual known as "courtship feeding". This probably serves a dual purpose, being on one hand an honest signal of male quality, and on the other a nutritional supplement for the female while the eggs are developing. Females of all parids beg for food using the same high-pitched "zeedling" call and wing-shivering display as used by fledglings.

[*Poecile rufescens barlowi*,  
Stevens Creek Park,  
Santa Clara,  
California, USA.  
Photo: Peter LaTourrette/  
VIREO]



at certain times of the year, such as small snails taken for the calcium by females during egg formation; (iii) the species' morphology, such as bill shape and size, legs, and so on (see Morphological Aspects); (iv) direct and diffuse competition with other species, including other parids, which may determine the specific foraging location or niche; and (v) the range of prey-handling techniques in the parid behavioural repertoire, which is remarkably uniform through the family.

The large numbers of caterpillars delivered by parids to their chicks can make a significant impression on the populations of their prey. This is indicated, for example, by the fact that Great Tit nestlings were heavier at fledging in an area where Common Blue Tits, which take the same prey but tend to nest slightly earlier, were removed, but lighter in an area where the Common Blue Tit nestlings were added into the resident Common Blue Tits' nests.

A major limitation on the ability of parids to reach invertebrate prey is imposed by the conformation of the bird's body mass, legs, wings and bill. Larger species, such as the Great Tit and the Tufted Titmouse, tend to hop-forage more on or near the ground, searching for seeds such as beech mast hidden in the autumn leaf litter, and to use hover and hanging postures far less frequently than the smaller, more agile species within the same foraging flock. A useful distinction has been applied here, especially in connection with the Nearctic parids, between, on the one hand, the foliage-gleaning guild, which generally includes the chickadees together with kinglets, *Dendroica* warblers (Parulidae) and the smaller titmice such as the Bridled Titmouse, and, on the other hand, the bark-foraging guild, consisting of the larger titmice together with, among others, nuthatches and American Treecreepers (*Certhia americana*).

An important type of behaviour associated especially with the smaller parids is that of hanging, in which the bird hangs by one or both legs, upside-down, in order to inspect a twig, leaf, bud or the like from every angle for small invertebrates. The frequency of this behaviour is so closely tied to the bird's weight that even within species, as noted in *Periparus* and *Lophophanes* tits, heavier individuals tend to use it less frequently than do lighter ones; moreover, an individual tit employs this behaviour less often later in the day, when its fat reserves have built up,

than it does earlier in the day. The frequency of hanging is related also to specific leg morphology (see Morphological Aspects). In various studies, hanging has been noted as utilized for less than 10% of the foraging time by such species as the Great Tit and the Tufted Titmouse, but more than 20% of the time by the Common Blue Tit and the Bridled Titmouse. Hanging is specifically mentioned as a foraging method for all *Cyanistes* species, for six of the 13 *Poecile* tits, but for only two of the 23 *Parus* species. As a means of inspecting awkward locations, an extension of hanging is the technique of hovering, or "reguline" foraging, which is similarly much more frequently practised by the smaller parids; furthermore, the larger parids, when they do hover, tend to do so for shorter periods. Many of the smaller parids, especially those in the genera *Poecile*, *Periparus*, *Cyanistes* and *Sylviparus*, but also a *Parus* species, the Black-lored Tit, also pursue insects in flight in the manner of an Old World flycatcher (Muscicapidae).

These types of behaviour are typically associated with glean-ing, in which the bird simply pecks the prey item from the substrate, whether leaf, twig or bud. Although this is the most common acquisition technique, that of probing, in which the bill is inserted in bark, in conifer needles, or between scales of a bud in order to remove prey, may also be important. Interestingly, Great Tits have been recorded as using a pine needle held in the bill to probe for larvae in a hole, although this is extremely uncommon. The ability to probe is closely related to the depth-to-length ratio of the bill, known as the bill index or the bill aspect ratio, and this behaviour is therefore used much more frequently by *Periparus* and *Lophophanes* than by *Poecile* and *Parus*. Moreover, its use varies within species, in that female Great Tits, which in some populations have a finer bill than males, tend to probe more frequently. Similarly, these fine-billed species, and fine-billed individuals, take smaller prey on average than do the heavier-billed species or individuals; and longer-billed, and thus finer-billed, female Great Tits tend to deliver more small caterpillars to their broods than do females with a shorter, stouter bill. Related to the subject of food-item size is the matter of food-handling, since larger prey and hard-coated seeds require significant preliminary processing, whereas small prey or seeds can be ingested with little or no such treatment.



An aspect of behaviour common to most parids, but observed especially for the heavier-billed *Parus*, *Baeolophus*, *Poecile* and *Cyanistes* species, and also for the Black-breasted Tit, notably the largest, heaviest-billed *Periparus*, is that of hammering or "hold-hammering". In this, the tit holds the item fast under one foot, when dealing with a caterpillar or similar prey, or between both feet, when handling beech seed, for instance, and repeatedly strikes the food vertically from above with the bill. The power of this hammering should not be underestimated. Although it may take him 20 minutes, a male Great Tit can open a hazelnut (*Corylus avellana*) in this way. The Black-breasted Tit may even use an "anvil", placing nuts in a crack in a branch in order to hammer them open.

Hold-hammering is utilized also to deal with larger caterpillars, in order to kill them before removing the head, thereby making the prey safe for a chick to eat. Great Tits, when processing caterpillars in oak woods, have been recorded also as drawing out the gut after removing the caterpillar's head, and discarding this before feeding chicks, although they do not do this if swallowing the prey themselves. The purpose of this procedure is to remove the tannins that may have accumulated in the caterpillar's gut, and which are known to reduce the growth rate of chicks ingesting them. Associated with these aspects of behaviour is an undoubted intelligence. For example, Great Tits have been shown to have a well-developed ability to solve problems by "insight" learning, in other words, to make decisions through insight into a problem, rather than through mere trial and error. This gives the parids enormous behavioural flexibility, which has contributed to their ability to exploit new resources. Common Blue Tits, for instance, have been observed to tap dead, hollow hogweed (*Heracleum sphondylium*) stems in winter to find overwintering grubs, and then to open them by hammering where the stem is not hollow. Similarly, Azure Tits have been observed to open plant stems in search of larvae, and in Africa the Southern Black Tit taps dry seedpods to enable it to identify those that contain chalcid wasp larvae. In America, Mexican Chickadees hammer open oak galls in order to remove

parasitic insect larvae, as do Great Tits in Europe, and experiments have shown that Great Tits can distinguish visually between viable and inviable beech seeds, that is full or empty ones, a skill which must save much time when they are searching for food. All these are examples of the tits' ability to read signs indicating the presence of hidden food, behaviour that has undoubtedly contributed to the family's success.

This adaptability is reflected in the worldwide use made by parids of birdtables and feeders provided by humans (see General Habits). Particularly favoured foods are peanuts, especially for *Parus*, *Periparus* and *Cyanistes* tits, sunflower seeds, for *Poecile* and *Baeolophus* species, and sources of fat such as suet or cheese, which are popular with many species in this family. Such provisioning is known to make a significant difference to the overwinter survival prospects of many parid species, and especially to the subordinate members of groups, which are frequently outcompeted in flock situations. For example, food provided by humans can increase the survival probability of juvenile chickadees by more than 10% over that recorded in unprovisioned groups. In Europe, the overwinter survival rate of Great Tits, especially of juveniles, is substantially higher when there is a good beech-mast crop, which often results in an increase in the breeding population in the following year. Failure of this and other crops, such as pine cones, can lead to irruptive movement of tits in Europe and Asia, as typified by the Siberian, Coal, Common Blue, Azure, Great and Yellow-bellied Tits, and by Boreal and Chestnut-backed Chickadees and titmice, especially the Tufted Titmouse, in North America (see Movements).

That the artificial provisioning of food has a significant effect on flocking species also is indicated by the way in which it influences the birds' daily management of their winter fat reserves. In the winter months, parids at northern temperate latitudes accumulate fat reserves as a means of helping them to survive the long, cold nights. Small species, such as parids, experience a rapid turnover of energy reserves and cannot store enough for more than a day or so. Consequently, fat reserves must be built up daily for use overnight. The additional weight of fat, however, brings a



Like other tits in the Nearctic, Palearctic and Oriental Regions, the **Common Blue Tit** builds its nest on a pad of moss. The depth of this pad is variable, depending on habitat, temperature and the time available for construction, with the pads in earlier nests being especially copious. For much of the nest-building phase, the female busily gathers moss and dumps it into the nest cavity. She enters occasionally to shape the pad with her breast, and when the moss lies deep enough she fashions a rough nest-cup lined with hair. Feathers are also collected, but they are usually laid over the eggs rather than woven into the base structure.

[*Cyanistes caeruleus caeruleus*, Bavaria, Germany. Photo: Konrad Wothe]

cost when the bird is in the presence of avian predators, such as the smaller *Accipiter* hawks, and tits attempt therefore to carry an optimum fat load that takes account of the probabilities of starvation and predation, rather than simply carrying the maximum possible. For this reason, dominant Great Tits, such as males, carry less fat than do subordinate individuals, such as females, because their status gives them greater access to food. Great Tits also carry more fat on colder days, when the starvation risk is likely to be increased, and they reduce their fat load when food is provided predictably, for example at a birdtable. In relation to this, residents carry less fat than do transients or "floaters". Similar observations have been made for group-territorial species such as Willow Tits and Black-capped Chickadees, for Tufted Titmice and for Coal Tits.

An alternative strategy to the storing of fat reserves is that of food-hoarding, or caching, especially of seeds in winter, although these caches are not necessarily treated as alternative stores by the birds. For example, Tufted Titmice, when their food supply becomes less predictable, increase both their caching rates and the size of their daily fat reserves. The distribution of the food-caching habit across genera, being especially prevalent in *Poecile*, *Periparus*, *Lophophanes* and *Baeolophus* species, is consistent with the pattern of two broad modes of caching behaviour: short-term caching by subordinate species, such as the Marsh Tit and Coal Tit, which in mixed-species flocks may benefit from having a cache that they can exploit after their competitors have left; and long-term caching by species for use during the harder months of winter, as by the Willow Tit, and perhaps also by the Tufted Titmouse, which is generally socially dominant. In general, as illustrated by the Willow Tit, caching behaviour increases as conditions worsen, subordinates store at greater intensity than dominants, but dominants increase their hoarding effort relatively more than subordinates as conditions worsen. Food-caching therefore reflects the birds' social and trophic environment, as does fat deposition.

While long-term caches consist typically of seeds, short-term caches can include invertebrates. For example, European Crested

Tits frequently store invertebrates that are still alive, but have been incapacitated by the bird. The association between food-caching and a pair-territorial or group-territorial social organization (see General Habits) is important for species which use the memory in order to refind caches. This is no trivial matter for birds that cache more than 40 seeds per hour, as the Marsh Tit does, or 200 per day, as the Willow Tit does; indeed, the estimated total numbers of items stored during the course of a year may reach half a million in the cases of the Willow and Siberian Tits. The proportion of seeds retrieved varies hugely, from just 15% by Siberian Tits to as much as 95% by Willow Tits, the latter representing a truly staggering mental performance. In order to achieve this, the tits must have a home range that is very stable over a long period, thereby enabling them both to build up an intimate knowledge of the area and to be in the same space to retrieve the food in the future. They must also have some reasonable expectation that their caches will not be stolen by other birds, rodents and the like. Some individual parids, notably some Great Tits, specialize in watching hoarding Marsh and Coal Tits and then stealing their caches. The Coal Tit, which stores food and is a flocking species, provides an exception to the general association between winter territoriality and food storage. The frequency of caching, however, varies markedly among Coal Tit populations, and it appears that, where they do hoard, the tits' rate of recovery of these items is rather poor, suggesting that, for this species, memory may not play so great a part in the relocating of items as it does for *Poecile* species. The extent of food-storing among *Periparus* tits is unclear: apart from the Coal Tit, the Yellow-bellied Tit is the only other member of this genus known to store. For *Periparus*, storing is probably a response to the birds' low social rank within mixed-species flocks, rather than being indicative of any long-term storage requirement.

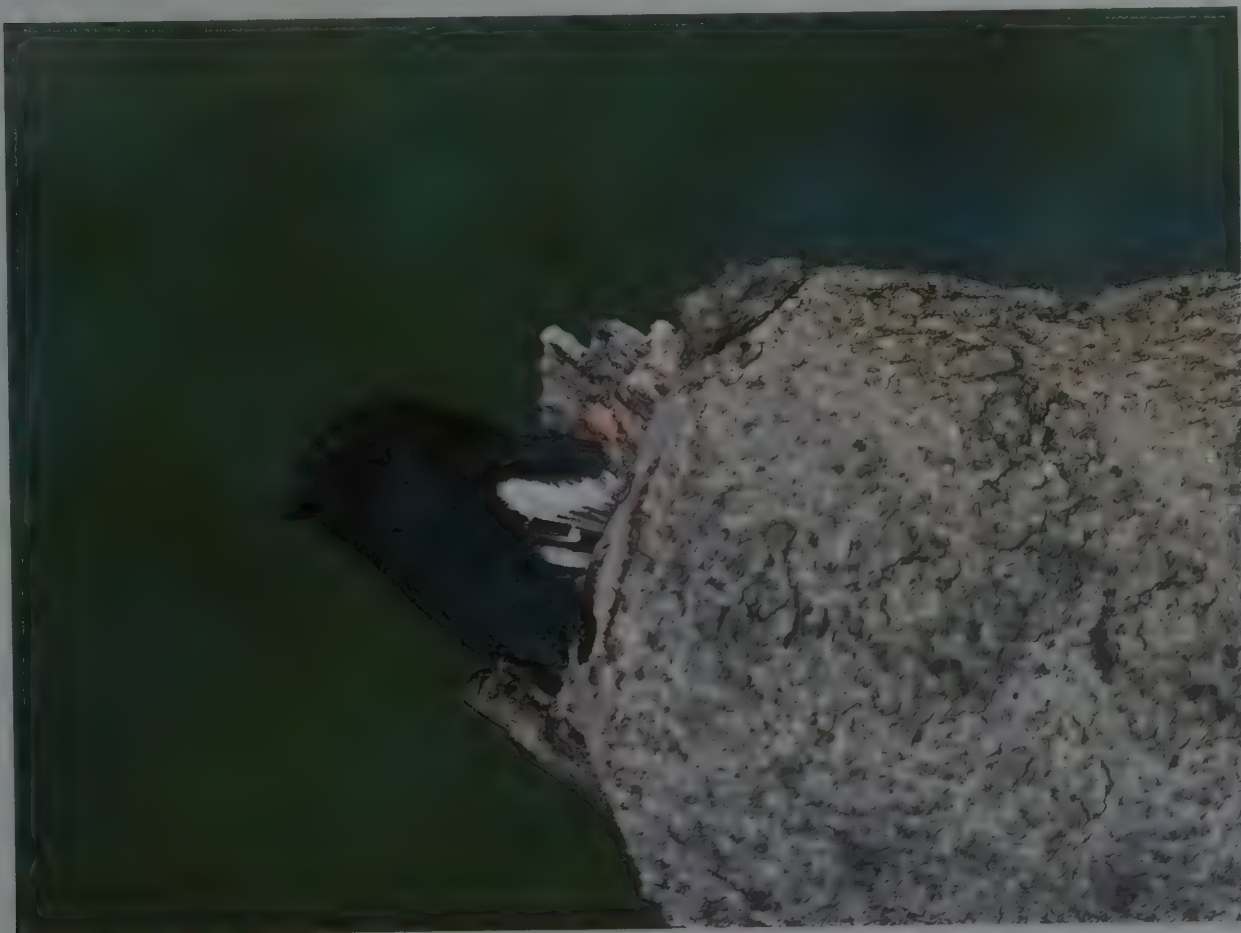
Competition for food, including caches, among parids can result in individuals making shifts in foraging niche when in the presence of dominant individuals or species. For example, Coal Tits and Willow Tits tend to feed in more exposed parts of the tree canopy, where the predation risk is greater, when they are in

All parids are cavity-nesters and most of them use natural holes in trees, usually 2-5 m above ground. The Afrotropical species, such as the **Southern Black Tit**, tend not to build a pad of moss to support the nest, presumably because moss is scarce in the arid and semi-arid regions of Africa. Instead, the pad is built from fine plant fibres, lichens and animal hair.

As with other tits, the female builds the nest alone. The Southern Black Tit often breeds co-operatively: more than 50% of pairs are assisted in territory defence and brood rearing by up to three male helpers, probably offspring from previous broods.

[*Parus niger niger*,  
Moses River,  
Bronkhorstspuit,  
South Africa.

Photo: Geoff McIlleron]







## Breeding

Much of the immense research effort carried out on parids has focused on the ecology and evolutionary aspects of breeding. Almost every aspect of the reproduction of the Paridae has been scrutinized, from the timing and size of the clutch, and the effects of population density and nest parasites on breeding success, to the function of pigments on their eggs, and the female's sex allocation of eggs/chicks on the basis of her mate's attractiveness.

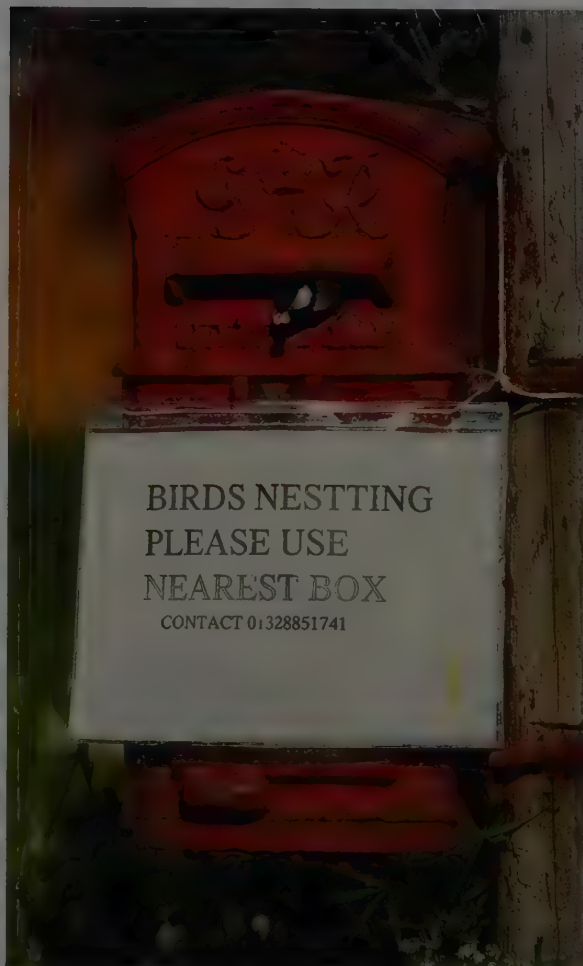
Breeding places great demands on birds for energy and protein. In general, therefore, parids have a distinct breeding season, which is timed to coincide with the maximum availability of food in the territory. Although many parids take a large range of plant food outside the breeding season, the chicks are raised on a diet of arthropods, and most species show a preference for caterpillars with which to feed the brood. As parids rarely drink water directly, and do not bring water to the brood, a strong attraction of caterpillars may be their relatively high water content, in addition to their soft and relatively digestible body. For many parid species, the timing and abundance of this food, such as the intense flush of caterpillars in broadleaf woodland in the northern spring, is a determinant of many key aspects of reproduction, including the timing of breeding, the size and number of eggs laid, growth performance and fledging success of the brood, and the decision to lay a second clutch. The precise timing of breeding varies among species in relation to the differences in local food availability. In addition, smaller species tend to start laying a few days before larger species at the same site, because the smaller female's absolute threshold of food required to form eggs is passed sooner than is that of the larger female; for example, Coal Tits lay before Common Blue Tits, which lay before Great Tits do. Nevertheless, while the precise timing is strongly determined by local spring temperature, which determines the timing of insect emergence, parid breeding throughout most of the

*While most tits use natural cavities, many species in the genera Poecile, Baeolophus and Lophophanes excavate their own nest-hole. In the Willow Tit, for example, both sexes dig out a cavity in rotting wood, although they may adapt an existing cavity made by a woodpecker (Picidae); this individual is using a typical woodpecker hole in a Scandinavian birch (Betula). Excavator species tend to be monogamous, with lifelong pair-bonds. It is possible that they are also locally subordinate species, with the best natural nest-sites being occupied by their dominant relatives.*

[*Poecile montanus borealis*, Liminka, Finland.  
Photo: Markus Varesvuo]

the presence of dominant European Crested Tits than when foraging in single-species groups, and Great Tits reduce the use of middle-height canopy when accompanied by Varied Tits. Similarly, immature Willow Tits and European Crested Tits forage in more risky sites in the presence of dominant conspecifics than when alone, and adult European Crested Tits generally cache items in those parts of the tree in which they also forage, whereas immatures were found to cache seeds in sites other than those where they were foraging. Coal Tits likewise tend to cache items in places away from where they are foraging in the flock. Studies of parids have established that birds are prepared to accept a greater risk of predation as the starvation risk increases. This was demonstrated in a study of Great Tits feeding on beech mast, where the tits searched in increasingly exposed locations as the winter progressed and the seed crop diminished. Many parid species with access to a predictable food source, as at a birdtable, increase their fat reserves, and hence also their mass and mass-dependent predation risk, at the end of the day, when the looming overnight starvation risk becomes a near-certainty, compared with an uncertain risk of predation, although hawks may also learn that this is a good time to visit the birdtable.

Long-term seed-storers at higher latitudes and for which the cache is critically important for their survival, such as Willow and Siberian Tits and Boreal, Mountain and more northerly Black-capped Chickadees, take care to select caching sites that are above the likely level of snow. Cache sites include hollows behind loose bark, crevices in tree trunks, bundles of dead leaves and pine needles under branches, inside bud capsules or in lichen, but more rarely in the ground. In contrast, Marsh Tits, which generally retrieve their cache within 48 hours, frequently store items close to the ground in wood piles, under moss clumps, and in leaf litter, as well as in holes in the ground and behind loose bark and similar places. Although the purpose of seed stores is generally that of aiding overwinter survival, a few species store food also during the summer, or, as in the case of the Varied Tit, may use stored food to sustain them while they forage for food for the chicks during the following breeding season.



*Many parids have been recorded nesting in man-made structures, including buildings, drainpipes, vehicles and streetlamps. The Great Tit, with its bold and inquisitive nature, is especially predisposed to a life alongside mankind, and mankind's paraphernalia. It has adapted so well to village life and suburbia that almost any suitable aperture can double up as a handy nest-site, sometimes with amusing consequences: in this case a pair has chosen to nest in a British letterbox, causing a slight disruption of the local postal service.*

[*Parus major newtoni*, Norfolk, England.  
Photo: Richard Brooks/  
FLPA]





In most tits, including the Marsh Tit, incubation is undertaken solely by the female. A typical incubation schedule is 50 minutes on the nest, followed by 10 minutes off the nest for feeding and sanitation, and so on. Periods of continuous incubation are increased when the male feeds the female on the nest, as happens in many parids. The clutch temperature is typically maintained above 30°C with body heat delivered through bare skin on the belly, the "brood patch". The first eggs are warmed at night by the roosting female, but the incubation period does not begin in earnest until the last egg has been laid.

[*Poecile palustris italicus*,  
Lentate sul Seveso,  
Milano, Italy.  
Photo: Alberto Cattaneo,  
Angelo Lietti & Paolo Lietti]

Nearctic, Palearctic and Oriental Regions occurs between March and July, with the most intense activity between April and June. The few exceptions to this general rule, such as the Black-crested Titmouse in the USA, the Canary Blue Tit on the eastern Canary Islands, and the Yellow-cheeked Tit in Thailand, have more southerly distributions, experiencing hot, dry summers, and may start breeding in February. Because the timing of breeding is driven by spring temperature, which has risen over the past 30 years, many parid species at temperate latitudes now start egg-laying some 2–3 weeks earlier than they did before 1980.

The breeding biology of most tit species in Africa is poorly known, but the breeding season appears to vary with latitude, generally falling in spring farther from the equator, and being distinctly less seasonal nearer the equator. Hence, north of the equator, White-shouldered Black Tits and Somali Tits breed during January–June and February–June, respectively. The southern species tend to have a more protracted season, influenced by the coming of rains, the Grey Tit breeding in August–March, the Ashy Tit in September–April, Carp's Black Tit in October–May, the Miombo Tit in August–December, Rufous-bellied and Cinnamon-breasted Tits in September–December, and the Southern Black Tit in August–January. Such evidence as birds in breeding condition suggests that, closer to the equator, the White-winged Black, White-bellied, Dusky, Red-throated and Stripe-breasted Tits may breed throughout the year.

Most parids are socially monogamous, and pair for life. The only species for which polygamy is known to be significant is the Common Blue Tit, nesting at high densities of, for example, more than one pair per hectare. Nevertheless, extra-pair paternity has been detected in other species. In studies of the Great Tit, genetic screening has revealed that young fathered by a male other than the territory-holder, or putative father, occurred in 8.5% of nests and accounted for 3.5% of offspring in the Netherlands, in 17% of nests (14% of offspring) in the UK, and in up to 44% of nests (8.6% of offspring) in Germany. Similar studies of the Coal Tit in Germany have revealed much higher rates of extra-pair paternity, with 75% of nests affected and some 25% of young

resulting from extra-pair fertilizations. No evidence was found that breeding density influences the rate of extra-pair paternity. Rather, it appears to have been some aspect of the putative father's fitness or "attractiveness", such as body size, that determined the likelihood of his being cuckolded. Although much rarer among pair-territorial and group-territorial species, extra-pair copulation has been recorded also for the Willow Tit.

The onset of breeding is typically marked by the break-up of the winter flocks, which is driven by the increasing frequency of aggressive interaction as males attempt to establish territories, and pairs form or re-form. With flocking species, many territories will be established beyond the normal home range of the flocks, because the food requirements for the winter flock differ starkly from those of the nestlings; for example, beech mast is fine for adults in the non-breeding season, but beech is a poorer tree than oak for the caterpillar prey required to feed the chicks. In pair-territorial and group-territorial species, the territories more often fall within the home range of the flock. Under both main systems of social organization, a number of first-year individuals will fail to establish a territory and to breed, because of a lack of suitable habitat. With flocking species, these generally become floaters, dispersing more widely in search of a territory; with group-territorial species, on the other hand, they may even co-operate in the raising of the brood of the alpha pair, as occurs among, for example, Bridled Titmice and several African *Parus* species. For most pair-territorial and group-territorial species, pair formation probably occurs before the winter, or the birds retain partners from the previous year. With flocking species, the timing of pairing seems more variable, and, while pairs from the previous year usually re-form, it is not clear whether loyalty is to a partner, rather than to a territory; divorce occurs frequently if breeding failed in the previous year. In these species, males are typically more loyal to a territory than are females, and from the available evidence brood desertion is generally believed to have been initiated by the female. Hence, females divorce males and their territories, and in mate selection it appears generally to be the case that the females select the males.



Mate-preference involves a number of facets, including song quality, body size and plumage badges, any of which may indicate a bird's health and fitness. The last two are displayed through specific exaggerated postures, especially head-up displays by *Parus*, *Periparus* and *Poecile* species, which present fitness-indicating badges. Females may themselves, however, occupy a position in a social hierarchy, and so may not obtain their preferred partner. Two post-mating indicators of the female's preference, revealing whether or not she paired with her preferred male, have been discovered through genetic screening of populations. First, poorer-quality males, such as smaller male Great Tits, and male Common Blue Tits with a duller blue crown, are more likely to have in their nests chicks that they have not sired, indicating that the female has accepted an extra-pair copulation. It should be noted that, in order to avoid this, males of these species guard their mates at the receptive egg-forming stage, so that extra-pair young indicate a failure by the male to guard his mate. Secondly, it has become clear recently that female Great and Common Blue Tits can adjust the sex ratios of their broods, and in so doing skew the ratio in favour of sons when they have an attractive partner.

Courtship behaviour generally involves courtship feeding. With the Black-capped Chickadee, this can start long before breeding territories are established, and this probably helps to inform the female of the male's ability to provide for her and the subsequent brood. For this and other species, however, courtship feeding may provide the female with essential additional food for the process of egg formation. Female Common Blue Tits may receive a third of their food from the male, which typically gives her the larger prey that he catches, during this period. To solicit this from the male, females of all parid species studied use the same high-pitched "zeedling" call and wing-shivering display as are used by fledglings when soliciting food from the parents. The contribution that males make to the female's nutrition during egg formation is likely to be considerable in the case of flocking species, females of which typically lay the equivalent or more of their own body weight in eggs within fewer than ten days.

All parids nest in holes, but the locations of these vary. Although the majority of the species favour a tree hole if such is available, many *Poecile* and *Baeolophus* species and the two *Lophophanes* tits excavate their own nest-hole in dead wood, and the nests of several *Periparus* species, and of the Ground Tit, occupy holes in the ground, such as those made by mice (Muridae), or on a sloping bank to prevent water entry. Excavated nest-holes are usually prepared by both members of the pair, but the nests are typically built by the female alone, as is the case with most other parids. Two *Parus* species are notable exceptions to this, these being the Grey Tit of southern Africa and the Black-lored Tit of India; with these two, nest-building is undertaken by both members of the pair, although it is not clear why they should differ in this respect from all other parids.

Many members of the family have been recorded as nesting in holes in man-made structures, including buildings, vehicles, letterboxes, and streetlamps and street signs. It is no surprise, therefore, that no fewer than 26 species, comprising ten *Poecile* species, one *Periparus*, one *Lophophanes*, five *Baeolophus*, seven *Parus* and two *Cyanistes*, have been recorded as using nestboxes. Further, the species missing from this list, such as most *Periparus* tits, inhabit primarily regions where boxes have never been provided. Since several of these species also use artificial nest-sites, the full list of parids that may use them is undoubtedly larger. It is notable that so many of the "excavator" species will use nestboxes if these are available, although, to encourage the birds to use them, it may be necessary to fill the boxes with sawdust to be excavated. There is some evidence that excavators tend to be locally subordinate species, the dominant species taking the best natural nest-sites.

The reuse of nest-holes in subsequent years is a common practice of many species, even when, to the human observer, alternative sites may appear to be available. Studies based on populations nesting in nestboxes have suggested that, because boxes used in previous years may have large parasite infestations, especially of fleas (Siphonaptera), which can reduce the growth and viability of nestlings, the adults should avoid the reusing of sites in con-

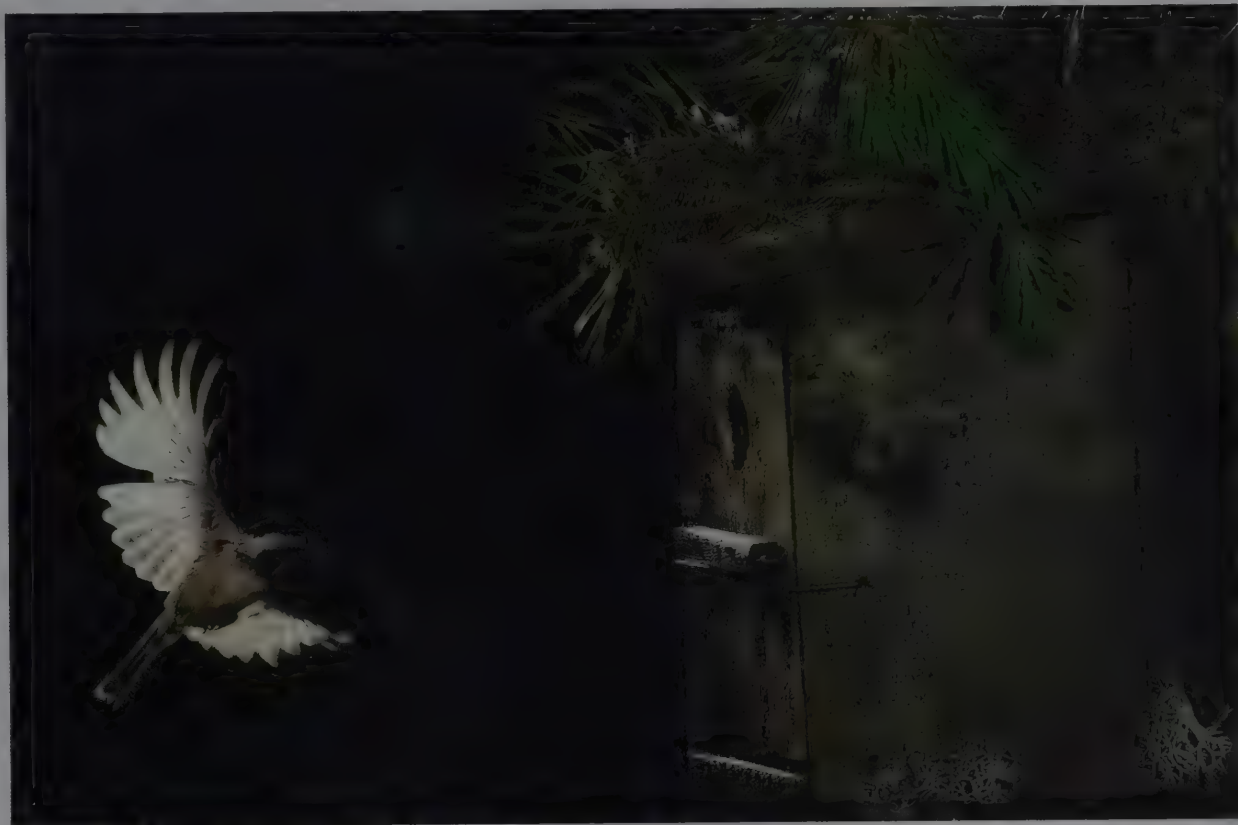
The breeding biology of the **Siberian Tit** has been studied at two sites in Finland. It was found to lay clutches of up to 11 eggs, which is typical for temperate parids. The chicks are fed by both parents for 19–20 days with breeding success of 4–6 fledged young per nest. This species lives in high-latitude conifer forests, and likely represents a return invasion of the Old World by a New World *Poecile*. This can be inferred from the fact that it is much closer, both genetically and in plumage characteristics, to the Nearctic Chestnut-backed (*Poecile rufescens*) and Boreal Chickadees (*Poecile hudsonicus*) than it is to any Palearctic or Oriental species.

[*Poecile cinctus lapponicus*, Kuusamo, Finland.  
Photo: Dick Forsman]



The female **Coal Tit** builds the nest alone, almost entirely from moss, usually in a hole in a tree trunk or an old stump. A variety of other crevices are sometimes used, including holes in walls or man-made nestboxes, as seen here. Some pairs even nest on the ground amongst stones or tree roots, or in mouse-holes. The brood is fed by both parents for 18–22 days, with breeding success being 50–90% in terms of eggs laid, but approaching 100% in terms of eggs hatched, at least in some habitats. In optimum situations the breeding territory seems to be very small, perhaps 100 m in diameter.

[*Periparus ater vieirae*, Almarza, La Rioja, Spain.  
Photo: José Luis Gómez de Francisco]



secutive years; and, certainly, experiments have shown that, if given a choice, Great Tits prefer neither to roost nor to nest in a hole containing an old tit nest. Studies of parids in natural nest-sites, however, suggest that parasite effects are often less marked in such sites, perhaps because of differences in micro-climate between natural nest-sites and artificial ones, and nest-site security from predators is probably a more important concern. Excavation of a nest-hole may both reduce parasite infestation and prevent predators from learning the locations of nest-sites, although the intense activity of excavation itself may attract the interest of predators.

The nests of seven parids still await full description, but those of the other 49 are remarkably uniform across the family and throughout its range. In species of the Nearctic, Palearctic and Oriental Regions, the base of the nest consists of a pad of moss, which may vary in depth from 1 cm to 8 cm, depending on species, temperature and the time available for its construction, the pad being deeper in earlier nests. Hence, this moss base is common to all *Poecile*, *Lophophanes* and *Baeolophus* species, to Palearctic and Oriental *Parus* except for the White-naped Tit in India, and to the Yellow-browed and Sultan Tits in the respective monotypic genera *Sylviparus* and *Melanochloa*. In *Cyanistes*, an exception is the Canary Blue Tit, which, instead of using moss, which is scarce within its range, generally employs grass or other dry plant material, together with hair and feathers. Although hair is used as a lining by all parids for which the nest is known, the pattern of usage of feathers in nests is unclear. Feathers are found regularly in the nests of six *Poecile* species, one *Periparus*, one *Lophophanes*, two *Parus* and two *Cyanistes* species, and occasionally in nests of a further one *Periparus*, three *Parus* and two *Baeolophus* species. The pattern of feather usage among species suggests that feathers do not serve an insulation function, and a possible alternative explanation is that they act as a distraction for predators attempting to find eggs. Certainly, human observers find it difficult accurately to count Common Blue Tit eggs in a pile of white Common Woodpigeon (*Columba palumbus*) feathers.

Perhaps the most complex nests are those of *Baeolophus*, which can contain moss, leaves, grass, hair and feathers, bark strips, and also, in the case of the Tufted and Black-crested Titmice, snakeskin. Grass, moss and hair are used also by the

Ground Tit, reinforcing its affiliation with the Paridae, rather than the Corvidae (see Systematics). The nests of four African *Parus* species have yet to be or on described in full detail, but those of the eleven others reflect the dry conditions of the nest-site in their composition, as they generally contain grass and/or vegetable down and hair, occasionally with wood chips as a base; in addition, feathers have sometimes been found in the nests of Grey and Ashy Tits. The grassy nests of southern parids tend to be shallower than the mossy constructions of the more northerly species.

Nest-building for all members of the family appears to involve the female in piling in the base layer, for example of moss, and then using her breast to push this into the corners of the nesting cavity. When the layer is deep enough, a rough nest cup is shaped, again by using the breast, and this is then lined with hair. Feathers, if used, tend to be piled in on top of the eggs, rather than forming a lining or being incorporated in the base structure. Females usually roost in the nest-cavity from before egg-laying through almost to the time when the brood fledges. Males may roost in another, often smaller, tree hole elsewhere in the territory or, later in the breeding season, simply on a branch close to the trunk of a tree.

While the eggs of a few parids have drawn much attention from biologists, in contrast those of two *Poecile*, two *Periparus* and five *Parus* species have not yet been described. Although small in absolute terms, parid eggs are large in relation to the size of the bird. Across the whole family, egg mass increases strongly and linearly with the body mass of the bird. For example, the Coal Tit has a body mass of about 9.8 g and an egg weight of about 1.15 g, corresponding approximate figures for some other tits being 11.6 g and 1.25 g for the Black-capped Chickadee, 16.6 g and 1.7 g for the Great Tit, 21.8 g and 1.84 g for the Tufted Titmouse, and 41.5 g and 2.51 g for the Sultan Tit. The relative mass, however, declines linearly with increasing bird mass, from 11.7% in the Coal Tit to 6% in the Sultan Tit. The eggs represent an enormous investment. Parids obtain most of their water from that contained in food, rather than by direct drinking, yet their eggs have a high water content of some 81.5%, which itself may be a heavy cost in drier environments. The remaining dry matter is about 43% protein and about 33% lipid by mass, which, summed over a clutch of 5–10 eggs, represents about 0.7–1.3 g





A Mountain Chickadee arrives at its nest, ■ disused woodpecker hole in an old dead pine, up in the Rocky Mountains. It is difficult to say whether this is a male or a female, as the species is sexually monomorphic. Both adults feed the brood, although most items are collected by the male, and the nestlings fledge after a period of 20–21 days. The young remain dependent on the adults for ■ further 21 days, after which they disperse. Like many other parids, this species first breeds when it is only one year old. The maximum recorded longevity is 10 years.

[*Poecile gambeli gambeli*, Colorado, USA.  
Photo: S., D. & K. Maslowski/  
FLPA]

of protein and 0.5–1 g of fat, in addition to the calcium required for the eggshell. The possibility that food availability may limit the female's ability to produce eggs is indicated by the fact that, as found with the Great Tit, for example, eggs laid earlier in the season tend to be smaller than those laid later. On the other hand, eggs are larger if the air temperature over the four days prior to laying, the time required for an egg to develop, is higher, which would encourage insect emergence. Calcium availability is perhaps the most significant nutritional constraint on egg formation, and female tits, during the laying period, search specifically for high-calcium prey such as snails, which they do not eat at other times of the year. Pieces of snail shell can often be found in the nest, taken in by the female during egg-laying, or to feed to the chicks, which also have a high demand for calcium. Severe calcium deficiency, as, for instance, in acid areas, results in shell-thinning or even, in extreme cases, in shell-less eggs being laid.

Parid eggs are generally white, with red-brown spots or speckles of protoporphyrin pigment. There is, however, some variation on this general theme. A given species may sometimes lay pure white eggs, and this is, indeed, the normal condition for the Ground Tit, the Bridled Titmouse and the Yellow-browed Tit. Although two of these species are close to the base of the parid family tree, pure white eggs do not represent a primitive condition, because, although they are typical of the Remizidae, the sister-taxon to the Paridae (see Systematics), parid-like speckled eggs are typical also of other closely related families, including Sittidae, Aegithalidae and Sylviidae. The white of the eggshell often has a slightly pinkish cast prior to incubation, possibly because of light transmission through the egg, which ceases when development starts. Variation in the colour of the spots has been noted especially on eggs of the White-winged Black and Southern Black Tits, the Miombo, Ashy, Grey and Yellow-cheeked Tits and the Sultan Tit, on which the spots are often greyish. This may be because of incorporation of protoporphyrin within the shell, so that it is partially obscured by shell calcite, but this requires investigation.

When present, the pigment spots vary greatly in intensity, both between clutches, the pattern of which tends to be more or less specific to the female laying them, and within clutches, since the eggs tend to be less intensely spotted early in the laying se-

quence of the clutch. Speckling is usually most marked at the blunt end of the egg, and often forms a ring around the air-cell, close to the broadest part of the egg. Recent studies of the eggshell speckling of Great Tit eggs suggest that its function is that of strengthening the shell, and of compensating especially for calcium deficiency. The pigment, which may act as a shock-absorber within the shell, specifically marks patches of thinner eggshell, and Great Tits laying in areas with lower soil-calcium availability, and hence lower snail densities, laid thinner, more intensely speckled eggs. There is a suggestion also, from work on the Common Blue Tit, that the female's condition, in terms of her immune-system function, may be reflected in eggshell speckling, but this could also indicate her nutritional status, perhaps affected by the availability of calcium. A further function of the eggshell speckling may be that of indicating the egg sequence to the female, since her incubation behaviour appears also to take account of the speckling patterns, which, in indicating eggshell thickness, must also indicate the propensity of the individual eggs to lose water through incubation. What does seem clear, however, is that eggshell patterning in the Paridae does not serve to camouflage the eggs from predators, as the eggs are clearly visible in the nest unless, as recorded for several species, the female, during the laying period, covers them with nest material before leaving the nest, in which case they are not exposed to predators.

Once laying begins, the eggs are typically laid at daily intervals until the clutch is complete, whereupon incubation commences. Gaps in laying may sometimes occur in response to short-term food shortage. Parids lay large clutches, but clutch size varies greatly both within species, in response to immediate environmental circumstances, and among species. Two broad patterns, which are not mutually exclusive, can be discerned. First, species at higher, temperate latitudes tend to lay larger clutches than those at lower, tropical latitudes. Within the genus *Parus*, for example, clutches of twelve eggs are common for the Great Tit in Europe, whereas eight eggs would be a maximum for Oriental *Parus* species, most clutches of which are of 3–7 eggs, and African species lay fewer than six eggs, most clutches containing 2–4 eggs. Similarly, the European Crested Tit's maximum clutch size of eleven contrasts with that of five for its Himalayan



The Great Tit has been described as the best-known avian species in the world. Its high population density and ready use of nestboxes make it a convenient subject for scientific research, and some populations have been producing data for decades. These data sets provide a unique insight into subtle ecological mechanisms, such as the processes underlying dispersal in young birds, and the timing of egg-laying. They show, for example, that the Great Tit precisely synchronizes the hatching of its eggs with the brief surge of invertebrate prey in the Palearctic summer.

[*Parus major major*,  
Mohias, Coaña, Spain.  
Photo: José María  
Fernández Díaz-Formentil]

congener the Grey-crested Tit, and the 13-egg clutch of the Coal Tit is much larger than the generally more modest clutch sizes of the Himalayan *Periparus* species, which consist mostly of fewer than seven eggs. Secondly, pair-territorial and group-territorial species tend to lay smaller clutches than do flocking species. Hence, while clutches of more than nine eggs are typical of Great, Common Blue and Coal Tits in Europe, they are always smaller than this in Nearctic *Baeolophus* species. At a given site, clutch size tends to decline through the season and, in line with this, second clutches tend to be smaller than first clutches. Much research has focused on the evolution of clutch size in parids, and in general it appears that the female lays a number of eggs that is consistent with her "prediction" of what the pair will be able to raise in order to maximize the chances of chicks surviving and eventually being recruited into the breeding population.

The incidence of second clutches also varies greatly within and among species, although it seems that more *Poecile* species have been recorded as laying a second clutch than have species in other genera. Since proof of re-laying requires the female to be identified, however, knowledge of this is of necessity incomplete. Second clutches occur particularly in habitats in which prey animals exhibit a low but prolonged peak of availability, rather than a sudden short-term flush. This low, protracted peak in prey abundance is linked especially with evergreen woodlands, such as conifer woods, and so it is noteworthy that Coal Tits, which are strongly associated with conifer forest, may even lay a third clutch. Timing imposes the severest constraint on the birds' ability to rear a second brood, since the postnuptial moult, which commences with loss of the innermost primary, starts immediately after breeding; indeed, the males of many pairs will start to moult before the first or the only brood fledges. Genuine second clutches tend, therefore, to be laid by females which laid the first clutch early in the season.

Incubation usually commences upon clutch completion. With later clutches, however, it may start up to three days, or three eggs, before the last egg is laid, in order to reduce the time necessary for the whole breeding attempt. This results in hatching asynchrony, the last eggs hatching up to three days after the rest, which may also lead to the death of the last chicks. Incubation does not start suddenly, but it increases gradually, the fe-

male delivering a little heat to the clutch at night when she roosts on the nest, even from the first egg. Although this may not be enough to initiate significant embryonic development, it is detectable by the time when full incubation starts by the greater weight loss, through water loss, from the first eggs than from later ones. In Britain, the warmer spring weather in recent years has allowed Great Tits to lay eggs so much earlier that they can delay incubation after clutch completion in order to optimize the timing of the hatch in relation to the predicted caterpillar peak. As a consequence, hatching asynchrony and brood reduction have become less frequent in these populations. Generally, incubation is undertaken solely by the female, but there are two known exceptions to this, both involving *Parus* species. These are the White-winged Black Tit in Africa and the Black-lored Tit in Asia, the males of which share incubation, although few details are available. For the task of incubation, the female develops a brood patch through which to deliver heat, the clutch temperature being typically maintained above 30°C. The males of many parids feed the incubating female, at least for some of the time, while she is on the nest. Otherwise, a typical incubation schedule for the female is 50 minutes on the nest, followed by 10 minutes off the nest for feeding and sanitation, then a return to the nest, and so on.

The duration of the incubation period is unknown for half of all members of this family. The gap in knowledge is greatest for *Parus*, for which the incubation period is known for only six of the 23 species. Typical known incubation time, however, is 12–14 days, with a clear mode at 13 days. It may be longer for more northerly species, up to 18 days in the case of the Siberian and European Crested Tits. The comparatively long incubation time of parids is typical of hole-nesters, which tend to have safer nest-sites than do birds with open nests.

Hatching success of tits and chickadees is typically high, with often 85–100% success within clutches. There appears to be a slight tendency for first and last eggs to be more prone to hatch failure, and recent research indicates that male eggs, which in all other respects, such as size, shape and colour, are the same as female eggs, are more likely to perish before hatching. Using its egg tooth, the chick hatches by breaking the shell between the air-cell and the broadest part, where there is a band of thinner shell





The nestlings of the **Common Blue Tit** are raised mainly on tree-defoliating caterpillars, perhaps because of their high energy and water content. They are also provisioned with adult *Lepidoptera*, as this photograph attests. Powered by this diet, the nestlings grow rapidly, essentially doubling in weight in the first three days after hatching, then doubling again after six days, and again after ten days, by which time the eyes are open and the plumage is well developed. At high latitudes, large broods are the norm. Seven chicks are visible here, but it is perfectly usual for a Common Blue Tit to lay 13 eggs in northern Europe; clutches found in excess of 18 eggs will almost certainly have been laid by two females.

[*Cyanistes caeruleus caeruleus*,  
St Giron, Ariège, France.  
Photo: Dave Watts]

Parids nest in cavities as a defence against predation, but this risk is not entirely removed.

The nest contents are sometimes eaten by

mustelids, rodents, sciurids, snakes and woodpeckers

(Picidae). Predation tends to be greater at the chick

stage than at the egg stage, presumably because

predators are attracted by the noise and odour produced by chicks. One

way of reducing the smell is to remove droppings in

the form of faecal sacs, as demonstrated by this

**Common Blue Tit**. This tactic is also beneficial

because it improves nest hygiene and reduces the risk of attracting parasites.

[*Cyanistes caeruleus*  
*obscurus*,

Orpington, Kent, England.  
Photo: Cyril Laubscher]



which may have a ring of spots. Parid hatchlings are blind and naked, apart from a few wisps of fine down on the head. Immediately from hatching they beg for food, presenting the pale yellow mouth to the female. The brood is fed by both parents, although the male may play a greater role in this when the female has to brood the young, for example, especially during the first week when the chicks are not yet able to thermoregulate for themselves.

Co-operative breeding, whereby individuals other than the genetic parents help to raise the brood, has been noted, or strongly suspected, for *Baeolophus* species, such as the Bridled, Tufted and Black-crested Titmice, and for all African species for which details are available, namely the Southern Black Tit, Carp's Black Tit, and the Rufous-bellied, Grey and Ashy Tits, and it may be that most, if not all, African *Parus* breed co-operatively. The Ground Tit, too, is a co-operative breeder. For those species for which relevant studies have been made, helpers are found to be related to the primary pair, and are often the young from a previous brood of that pair. In the case of the Ground Tit, helpers, which are always male, are also more closely related to the primary pair than are randomly sampled males in the population. For all these species, the assistance provided by helpers in the raising of kin probably represents a better strategy than that of trying to find a mate and to breed independently in an environment in which nest-holes may be scarce and the species' density very low.

The nestlings grow very rapidly, essentially doubling in weight from the time of hatching (day 1) to day 3, then again to day 6, and again to day 10, by which time the eyes are open and the plumage is developing. By day 15, they reach or, indeed, may well have surpassed their parents' weight through the accumulation of body fat, as well as through the increase to full-grown body size; it is not uncommon for Great Tit chicks to fledge at a weight of 23 g, although their parents weigh 17–19 g. In order for the young to achieve this, the parents of larger broods have to deliver prey at a prodigious rate of up to one caterpillar every 2–3 minutes, parids usually delivering only one prey item at a time to the nest; initially they catch smaller prey closer to the nest,

and then gradually larger prey as they forage farther from the nest. This achievement is all the more remarkable because in this brief period of time the adults not only find and select prey, but also process it for the brood (see Food and Feeding). In addition to the main prey, the parents bring minerals and nutrients such as grit, and snail shell to provide calcium for growing bones. When calcium is scarce, deformities, especially of the legs, have been noted, as with, for example, the Great Tit and the Mountain Chickadee. As well as bringing food to the brood, the parents remove faecal sacs, dropping these well away from the nest so as not to attract predators. Nest predators include mustelids, rodents, sciurids, snakes and woodpeckers (Picidae), and predation at the chick stage tends to be greater than that at the egg stage, presumably because predators are attracted by the chicks' calls.

As with incubation, the length of the nestling period is unknown for half of all parid species. For those for which it is known, it is generally 16–22 days, with a mode of around 19 days. The variation probably reflects food availability and, hence, the rate at which the chicks develop. The Ground Tit appears to be an exception in having a prolonged nestling period, believed to be up to 25 days. Parid chicks are more or less fully developed and well feathered at fledging, although the wings, the tail and the bill may be only about 85–90% of their final lengths. As the fledging weight of chicks is a strong indicator of food availability, chicks of early broods tend to be heavier than those of later broods, and chicks in small broods tend to be heavier than those in large broods. The weight at fledging is a strong determinant of a chick's probability of surviving not only the first few days, but also the longer period leading to subsequent recruitment into the breeding population.

The "decision" on when the chicks leave the nest is made by the parents, which have to induce the young out by ceasing to feed them directly but, instead, presenting food tantalizingly from outside the nest-hole. The sequence of departure is not random, the second heaviest often being the first to leave in the case of Great Tit broods, but once a few have left, and are being fed outside the nest, the rest must follow or, if they do not, starve.





The timing of fledging is determined by a shift in adult behaviour in the **Black-capped Chickadee**, and all other parids. The adults start to present food items outside the nest-hole, tempting the hungry nestlings to leap from the cavity one by one to a nearby branch, where they are fed. After fledging, the young are provisioned by both parents for a further 21–28 days, although they can feed themselves within seven days of fledging. After a month on the natal territory the young disperse over short distances.

[*Poecile atricapillus*,  
Montana, USA.  
Photo: Alan G. Nelson/  
Animals Animals]

The young tits are dependent on one parent, usually the male, or on both parents for a period of time after fledging, and, among co-operative breeders, helpers have also been recorded as continuing to feed the brood-members after they have left the nest. The length of the period of dependency varies widely from one species to another. Although it is unknown for most members of this family, the 17 parids for which it has been documented show a pattern in which pair-territorial and group-territorial species tend to have much longer periods of dependency than do the flocking species, the high-density populations of which place a premium on the achieving of independence. Examples of fledgling dependency in the former groups are 21–45 days for *Baeolophus* titmice, 50 days for Southern Black Tits, up to 60 days for Carolina Chickadees and 80 days for Varied Tits, whereas illustrations of dependency among flocking species include usually 6–8 days for Great Tits and about 7 days for Common Blue Tits. When comparing these strategies of pair-/group-territorial and flocking species, and when comparing breeding strategies within flocking species such as the Great Tit in years of high and low breeding density, a trade-off emerges. This is between the strategy of having few, high-quality fledglings, such as in a high-density "competitive" situation, and that of flooding the woods with large numbers of poorer-quality young, as in the low-density, low-competition situation.

## Movements

Although Paridae contains some of the most sedentary of passerine birds, particularly among the pair-territorial and group-territorial *Poecile* species, and although none can truly be classified as migratory, three well-defined recurrent patterns of movement can be identified within the family. These are post-juvenile dispersal, altitudinal movements, and eruptions. In the last two cases, the movements are clearly a response to a declining food supply and worsening autumn or winter weather conditions. Post-juvenile dispersal is also driven partly by the search for food, after the young become independent of their parents, but it is also governed by the future need of juveniles to find territories of their own.

Elevational movements, such as the descent of the Himalayan-dwelling Black-breasted and Rufous-vented Tits to lower levels

in winter, may appear to be largely predictable. Nevertheless, even these species remain above 2000 m, and these are only partial migrations in that it is not the entire populations that move, many individuals remaining at very high altitude throughout the winter months. In many partially migratory passerine species, the individuals that do not migrate are adults staying on territory; the migrants are first-years, and this could be seen as an extension of post-juvenile dispersal, which may be the case with these altitudinally migrating tits.

Altitudinal migration has been reported for no fewer than nine *Poecile* species, namely the Sombre and Willow Tits, the Black-capped, Mountain, Mexican, Boreal and Chestnut-backed Chickadees, and the White-browed and Varied Tits. It is recorded also for four *Periparus* species, the Black-breasted, Rufous-vented, Spot-winged and Coal Tits, for one *Lophophanes*, the Grey-crested Tit, for one *Baeolophus*, the Black-crested Titmouse, for four *Parus* tits, the Great, Green-backed, Black-lored and Yellow-cheeked Tits, and for two *Cyanistes* species, the Common Blue and Azure Tits. Of these twelve species outside the genus *Poecile*, nine migrate altitudinally within their Himalayan ranges at very high elevation, whereas none of the *Poecile* species listed occurs in the Himalayas, and the *Poecile* movements tend to occur across a much shorter distance than do those of many of the other species. One may speculate that, while the altitudinal migration by all these species is only partial, some individuals, probably adults, remaining all year on the breeding grounds, the social organization of *Poecile*, with the need to join a group territory, may place a greater stress on juveniles of this genus than is placed on the juveniles of *Periparus*, *Parus* and *Cyanistes* by a flocking social organization when at similar altitude.

Although social organization may act to ameliorate the effects of food shortage on starvation risk and, hence, on movements, ultimately it is the availability of food, rather than social organization, that determines these movements. Such effects are clearly evident at a local level when, for example, Coal Tits are reported as visiting feeders in British gardens at significantly higher densities in years of a poor beech crop than when the crop is abundant, or it is noted that European Crested Tits moved much farther after a storm felled most trees in their Belgian territory. It is all the more evident, however, on the national or international scale in the form of mass-exoduses, or eruptions. In north and east Europe, eruptions of Great Tits, Common Blue Tits and, to a

After fledging, young tits remain dependent on one parent, usually the male, or on both parents. The duration of this period of dependency varies widely in the 17 species for which it is known. The period lasts longer in pair-territorial and group-territorial species than it does in flocking species. Fledglings are dependent for 21–45 days in *Baeolophus titmice*, and 35–80 days in *Poecile* tits, for example, while they are only dependent for 6–8 days in the Great Tit (*Parus major*) and seven days in the **Common Blue Tit**. It seems likely that the high-density populations of the latter species place a high premium on achieving independence.

[*Cyanistes caeruleus*  
*caeruleus*,  
Germany.  
Photo: Robert Maier/  
Animals Animals]

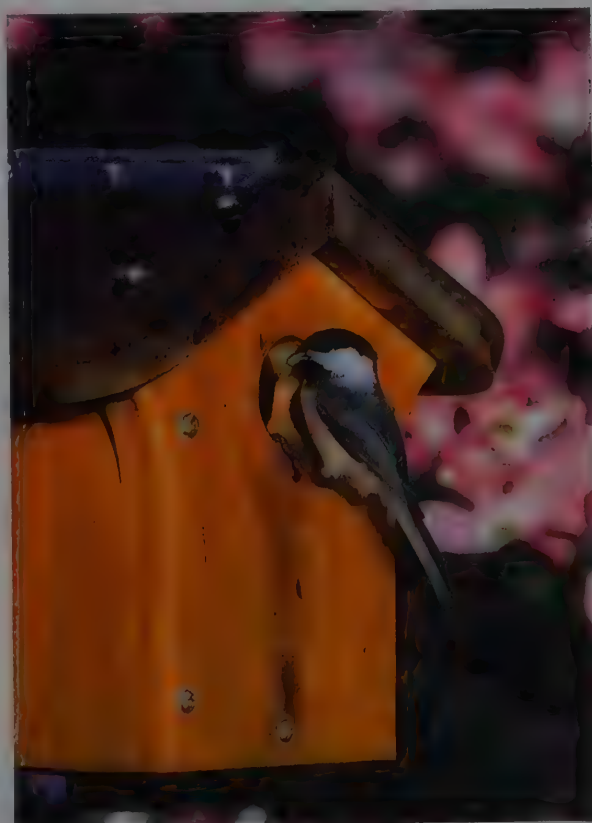


lesser extent, Coal Tits occur, when individuals move south and west across the rising temperature gradient, in years of beech-crop failure or very heavy snowfall. Some of these tits reach as far west as Britain, although, with the first two species, that tendency has declined since the mid-1970s, presumably because of rising winter temperatures and a greater propensity for humans to feed birds in winter. Eruptions arising from failure of seed crops, primarily beech mast or pine seed, is reported for three *Poecile* species, the Willow Tit and the Boreal and Chestnut-backed Chickadees, for one *Periparus*, the Coal Tit, for one *Baeolophus*, the Tufted Titmouse, for one *Parus*, the Great Tit, and for two *Cyanistes* species, the Common Blue and Azure Tits, indicating that fleeing from food shortage is a widespread response in Paridae. In some cases, irruption by a species into an area beyond its normal range can bring it into competition with congeners. Such a situation occurs with the Azure Tit, which, when forced west into the range of its smaller sibling species, the Common Blue Tit, is socially subordinate to it. This probably reflects site-related dominance, since local birds are normally socially dominant over immigrant or transient individuals, but it may relate also to the Azure Tit's weaker plumage badges, referred to earlier (see General Habits), which may signal its subordinate rank to the Common Blue Tit; dominance status is as much in the eye of the beholder as in the heart of the actor. Site-related dominance is an important driver of social organization in flocking parids, but less so in pair-territorial and group-territorial species such as the Black-capped Chickadee, although, for the Willow Tit, "prior residency" is important in determining dominance hierarchies. In flocking parids, it determines that an individual may behave as dominant in its own territory or home range, but as subordinate when away from that range. It was first described by an amateur ornithologist, A. Brian, in relation to the Great Tit, and, although the description of its occurrence related to the breeding season and probably, therefore, referred to territorial individuals, it is important also in winter, and especially at feeders. Although flocking species display greater fluidity in their flock-joining behaviour, they tend to establish a regular "beat" during a given winter. This is shown by analysis of ringing recoveries of British Great and Common Blue Tits, which demonstrates a significantly stronger tendency to travel distances of more than 20 km from one winter to another than they do within a single winter period.

Despite the observation of between-winter movements of more than 20 km made by adults, such lengthy displacements are exceptional, making up far less than 1% of all movements recorded in ringing studies. In general, parids are most mobile in the period prior to territory establishment. The main times of the year during which movements seem to be most significant are, first, the exploratory-dispersal period of juveniles after they become independent of their parents, which may extend through the summer with the coalescing of juvenile flocks, and, secondly, the late winter

Parids are among the most popular of birds in the Northern Hemisphere. Their fame and familiarity rests not on their beauty, although they are undeniably pretty, but on their confidence and tameness. Indeed, there are plenty of beautiful birds that are too rare or shy to make much of an impression on the general public. In particular, tits are more than willing to accept handouts of food, and to occupy nestboxes. These are key factors in allowing many parids, including the **Carolina Chickadee**, to survive and thrive in cities and gardens.

[*Poecile carolinensis*  
*extimus*,  
Hamilton County,  
Ohio, USA.  
Photo: Dave Maslowski/  
Maslowski Productions]







During the European winter, the **Great Tit** may swarm around peanut feeders in suburban gardens. Provisioning by humans is known to improve the tits' survival prospects significantly. It allows them to overwinter in suboptimal habitats, and it increases their population density around gardens or in suburban settings. There has thus been an extraordinarily positive feedback between tits and humans in terms of quality of life. The more tits there are in nestboxes and around feeders, the more pleasure humans derive from watching them, and thus the more humans there are putting out nestboxes and feeders, which leads to more increases in the populations of tits around human settlements.

[*Parus major major*,  
El Pont de Suert,  
Lleida, Spain.  
Photo: Jordi Bas]

and early spring, when the need to establish a territory becomes most acute. There has been much debate over the importance of, on the one hand, genetically inherited tendencies, with the question of whether some birds possess a genetic predisposition to disperse, and, on the other, the role of competition in driving dispersal. Detailed investigations of Great Tit behaviour and movements, especially in the Netherlands, Belgium and Britain, indicate that, although broodmates tend to move similar distances and in similar directions to reach their first breeding sites, this is because they tend to move together, rather than because they are genetically predisposed to move for a certain distance or in a particular direction. Genes do, however, appear to be involved in determining what has been termed the bird's "personality", its intensity of exploratory behaviour in novel environments, and this has a bearing on dispersal, since fast-exploring parents have offspring that disperse farther, immigrants tend to be faster explorers than locally bred individuals, and post-fledging movements tend to be greater for fast-exploring females than for slow-exploring ones.

In general, studies of dispersal have found that female parids move farther between the natal site and the site of first breeding than do males, although most individuals, of both sexes, settle within 3 km of the natal site. The apparently greater mobility of females may reflect their lesser attachment to territory, establishment of which often starts in the autumn for flocking species, but it may be linked also with their lower social dominance, since reduced access to food is likely to cause individuals to move more. This may be reflected further in the greater overwinter mortality reported for females, compared with males, of several species, examples being the Great Tit and the Willow Tit, but not the Coal Tit, although it may equally represent a cost of reproduction. For example, Willow Tit females that do not breed in their first breeding season are more likely to survive to the next year.

That social dominance, related to prior residence, plays a part in driving dispersal is suggested by a number of observations and experiments. In some Great Tit populations, such as in Belgium, later-fledged young are more likely to emigrate than are earlier-fledged young. This has not been observed in all populations, as demonstrated by studies at, for example, Wytham, in southern England, but it might reflect the size and configuration of woodland habitat patches rather than any genetic or social difference between the populations themselves. In both of these aforemen-

tioned populations, it has been noted that later-fledged young are more likely to have retained the juvenile greater coverts after the post-juvenile moult, which occurs during that first summer, than are earlier-fledged young. Females of the Great, Common Blue and Coal Tits are also more likely to retain juvenile greater coverts than are males. There is evidence that incomplete moult of this nature reflects nutritional stress at the time of moult more than it does any genetic predisposition, therefore suggesting that these later young are more stressed than are the earlier young. For example, juvenile Great Tits with retained greater coverts tend to be in poorer condition in winter. It is likely that what makes the difference between early-fledged and later-fledged young is the greater competition imposed on later young at their most vulnerable time by earlier young, which have already had time to establish themselves. There is no doubt that the greatest mortality experienced by juveniles occurs during these first few days or weeks after fledging, and especially around the time of independence. Furthermore, it was shown many years ago that the survival rate of second-brood young Great Tits was significantly enhanced if chicks from first broods were removed from the area.

Finally, in relation to social pressures, it is perhaps no surprise to find that it is immatures that are the first to discover and exploit new resources. They are also the first to risk returning to feed at a feeder after a predator has left. It was probably a juvenile Common Blue Tit that first discovered in England, in 1921, that rich pickings lay at the top of a milk bottle if it could peck through the foil top; Great Tits learned this habit later.

### *Relationship with Man*

Parids have a strong association with humans in the Northern Hemisphere, where they are among the most familiar of all birds. This is not only because of their tameness and willingness to accept food and nestboxes provided by people, but also because their acrobatic antics are among the most engaging of those seen in the bird world. Tits and chickadees feature prominently, therefore, in European and native North American folklore.

The name "titmouse" is first recorded in English in 1325, as *titmose*, from the Middle English word *tit* or the Icelandic *titr*, meaning "small", and *mase*, an Old English word meaning "a small

The **Stripe-breasted Tit** is a restricted-range species present in the Albertine Rift Mountains Endemic Bird Area, a region that is poorly known and difficult to visit outside south-west Uganda. This species is common throughout the montane zone, mainly between 1800 m and 3400 m, in forest, bamboo-dominated undergrowth, and tree-heath. It survives in good numbers, even in fairly degraded forests, but its small range means that continued clearance of suitable habitat might place it at risk in the future. Females can be distinguished by their slightly browner heads and breast stripes; the individual pictured here is an adult male.

[*Parus fasciiventer*  
fasciiventer,  
Bwindi-Impenetrable  
Forest National Park,  
Uganda.  
Photo: Greg & Yvonne  
Dean]

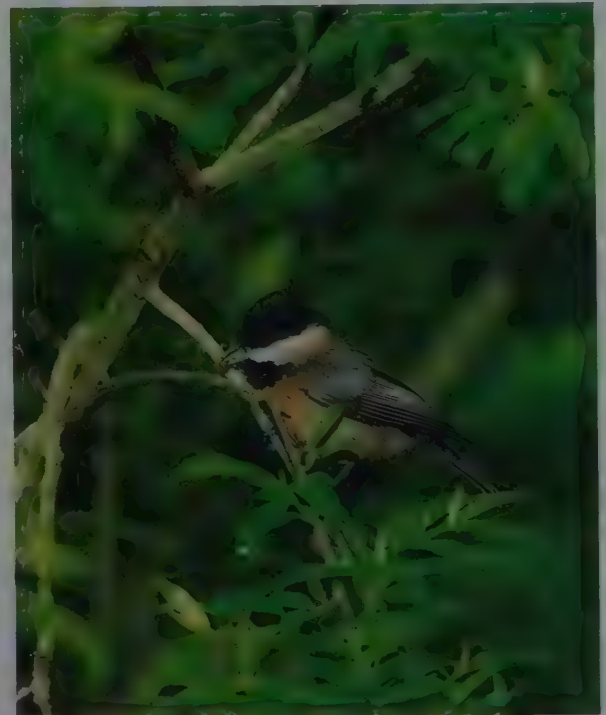


bird". Hence, *titmose* is literally a small, small bird. This form is last recorded in 1570, by which time the form "titmouse" had come into use, possibly encouraged by the mouse-like behaviour of the familiar parids with their quick, flitting actions. Incidentally, since the "mouse" part of the word here is a corruption of the Middle English *mose*, its plural should technically be "titmouses", rather than "titmice", although this presents an "uncomfortable" sound to the modern English-speaker. "Titmouse" remained the common usage in both British and US English until the twentieth century, during which the abbreviated form "tit" became commoner for informal use, and for formal use from the 1950s, in Britain, while "titmouse" remained in use for the *Baeolophus* species of the USA. The North American name of "chickadee" obviously alludes to the calls of the Nearctic *Poecile* species; it is not clear whether the word was used first by Europeans, but it was first recorded in English by H. D. Thoreau, in 1838.

The significance of parids to humans is indicated by their appearance in traditional folklore. For the native North Americans, who traditionally stressed the close relationships between humans and nature, the chickadee often had special significance. Chickadees frequently occurred in the dream beliefs of the Pueblo Indians, although the chickadee often offered false gifts to the dreamer. These dreams were induced during fasting, and the coming of the chickadee in children's dreams became an accepted part of the vision-generating fast. In other Indian cultures, the chickadee was more valued. The Indian tracker Tom Brown, Jr, said: "We learned to be patient observers like the owl. We learned cleverness from the crow, and courage from the jay, who will attack an owl ten times its size to drive it off its territory. But above all of them ranked the chickadee because of its indomitable energy for life." In reporting his childhood dreams, the Chief of the Crow Nation, Plenty Coup, stated that he "was made aware of the tiny chickadee who was least in strength but strongest of mind among his kind. This little speck of a bird was willing to work to gain wisdom, and he was an exceptional listener. Nothing escaped his ears, which he had sharpened by constant use...". Furthermore, he said that the chickadee taught him "Develop your body, but do not neglect your mind. It is the mind that leads a man to power, not strength of body... We must be wise like the chickadee...". One may speculate that, among native North American cultures, respect for the chickadee's wisdom arose from

observation of the birds as they hoarded food for the winter. Chickadees can also be prominent in European American culture; for example, the Black-capped Chickadee was formally adopted as the state bird by the Massachusetts Legislature in 1941.

Folk traditions derived from parids exist also in the Old World. In Finland, the song "Ti-Ti-Tyy Jenka" was said by its composer, Orvokki Ramsi, to have been inspired by the song of the "European titmouse", and an old Estonian proverb states *Paremb tiganõ peoh ku mõtus ossa pääl*, meaning "Better a titmouse in the hand than a wood-grouse on a branch". In east Asia, the importance of the Varied Tit as a cagebird in Korea is underlined by its depiction on a set of stamps. Similar anthropological evidence for hu-



One poorly known parid is endemic to the Central Sichuan Mountains Endemic Bird Area: the **Rusty-breasted Tit**. It is generally found between 2135 m and 3400 m in mature mixed forest, usually with a component of spruce, fir, pine, birch, poplar, alder and oak, and an understorey of bamboo. It is a restricted-range species, but is not globally threatened. Its population is fairly large, though given the small range, and the accelerating deforestation occurring within it, it may decline in future. The situation requires monitoring.

[*Poecile davidi*,  
Jiuzhaigou, Sichuan, China.  
Photo: Bernard van Eiegem]





The **Yellow Tit** is restricted to Taiwan, breeding in temperate primary broadleaf forests at 1000–2500 m, and descending to lower altitudes in winter. It is generally uncommon, but perhaps more numerous in the hilly south and west of the island. The large-scale destruction of suitable forests is causing a decline, especially as the species seems to be out-competed in marginal habitats by the Green-backed Tit (*Parus monticolus*). Numbers are further reduced by illegal trapping for the cagebird trade. The Yellow Tit is classified as a Near-threatened species present in the Taiwan Endemic Bird Area.

[*Parus holsti*,  
Wu Tai, S Taiwan.  
Photo: Penshing Liao]

man familiarity with parids comes from the number of alternative names that exist for some of the species. These may reflect an association in the human mind between the bird and the land, such as the old English name of "Ox-eye" for the Great Tit, or they may demonstrate familiarity with a species' behaviour, as in the English name "Billy-biter" for the Common Blue Tit, other names for which include "Tom Tit", "Blue Cap" and "Nun", or they may allude to the species' vocal character, as with the name of "Saw-sharpener" for the Great Tit. The importance of the Common Blue Tit to city people is nicely illustrated by the results of a recent competition held by the BBC, in London, England, to find a new name for the species. With more than 500 votes cast, respondents suggested some 40 different names, including "City Blue", "Fidget", "Bluey", "Tweety" and "Mrs Blue", but the winner, with 53% of the vote, was "Wee Mum".

The human fondness for parids is partly a result of the willingness of tits and chickadees to come for food put out at feeders and on birdtables (see Food and Feeding), but it is also strongly linked with their willingness to use artificial nestboxes. The interest of many young birdwatchers must have been awakened by the intense activity of a pair of Common Blue Tits or Black-capped Chickadees at a nestbox. Had this habit done no more than raise people's interest in birds and the natural world more widely, it would have served both humans and the birds well, but the attraction of, especially, Great Tits to nestboxes has provided the sciences of ornithology and ecology with the most powerful insights into the workings of natural populations. The ultimate reasons for the intense interest in Great Tits is surely one of convenience, but much of what is known about the evolution of clutch size, of density-dependent population regulation, of the timing of reproduction, and of the effect of food supply on population dynamics and on other demographic processes, to name but a few aspects of avian ecology, has its roots in a few long-running and detailed nestbox-based studies of the Great Tit, some of these having started more than 60 years ago, especially in the Netherlands and UK. The initiation of these studies was motivated in about 1900 by the desire to control caterpillar pests in orchards. Conservation science owes much to this species' interest in peanuts and nestboxes.

### Status and Conservation

In conjunction with the behavioural flexibility of parids in general, and their adaptability to anthropogenic change, only four of the 56 species are listed by BirdLife International in any category

other than that of Least Concern. All four occur in the Oriental Region. One of these, the White-naped Tit of India, is globally threatened, being classified as Vulnerable, while the other three, the Palawan Tit, the Yellow Tit and the White-fronted Tit, are listed as Near-threatened. The threats that these species face vary. The White-naped Tit is threatened chiefly by loss, fragmentation or degradation of its thornbush habitat; it has recently suffered a rapid population decline. The Palawan and White-fronted Tits, both restricted to the Philippines and both uncommon, are at risk because of the suspected dependency by their localized populations on habitat that could be threatened. The last of the four species, the Yellow Tit, although its habitat appears to be secure, occurs at low density and may be threatened by the trapping of wild birds for export. Incidentally, some populations of the Varied Tit in east Asia may likewise be at risk through trapping for the cagebird trade. Given the widespread use made of nestboxes by other parid species, one wonders whether some of these Oriental species could perhaps be helped by the provision of such boxes. Away from the Oriental Region, in Africa, the Red-throated Tit may also be considered to be potentially at risk because of habitat degradation, and the Miombo Tit is potentially vulnerable because of its specific habitat requirements.

Although not threatened globally, a number of other species contain populations that may not be secure. Regional forest clearance gives cause for concern for populations of the Bridled Titmouse along the Gila and lower Salt Rivers, in south USA, the Mexican Chickadee in central Mexico, the Siberian Tit in Norway and Finland, the Dusky Tit in western Angola, the Stripe-breasted Tit in the Albertine Rift, in central Africa, the Yellow-bellied Tit in China, and the Sultan Tit in the western Himalayas and northern India; the last-named is no longer found in Bangladesh. In addition, the Rusty-breasted Tit, a restricted-range species found in the mountains of central Sichuan, in China, may be more at risk than is formally recognized.

Other populations considered to be at risk include the Marsh Tit and Willow Tit in Britain, where both species have declined over the last 30 years, in the latter case dramatically rapidly, the Willow Tit having almost disappeared from a number of southern counties where it was formerly common. The reasons for these declines are not clear, but they possibly include increasing competition with Common Blue Tits, both for nest-holes and when foraging in winter, and a reduction in the availability of low nest-sites because of browsing pressure from an increasing deer population. In a very few cases, entire subspecies are at risk. These include the race *degener* of the Canary Blue Tit on Fuerteventura



The **Palawan Tit** is restricted to the Palawan Endemic Bird Area, centred on the Philippine island of Palawan. It occurs in the lowland and submontane zones, in a range of forest types, including primary forest, secondary forest, and the margins of swamps and cultivation. This ecological flexibility suggests that it is not immediately threatened with extinction. However, intensive logging is escalating within its restricted range, and a fairly rapid population decline is likely. The species is therefore classified as **Near-threatened**.

[*Periparus amabilis*,  
Buenavista,  
N of Puerto Princesa,  
Palawan, Philippines.  
Photo: Ian Merrill]

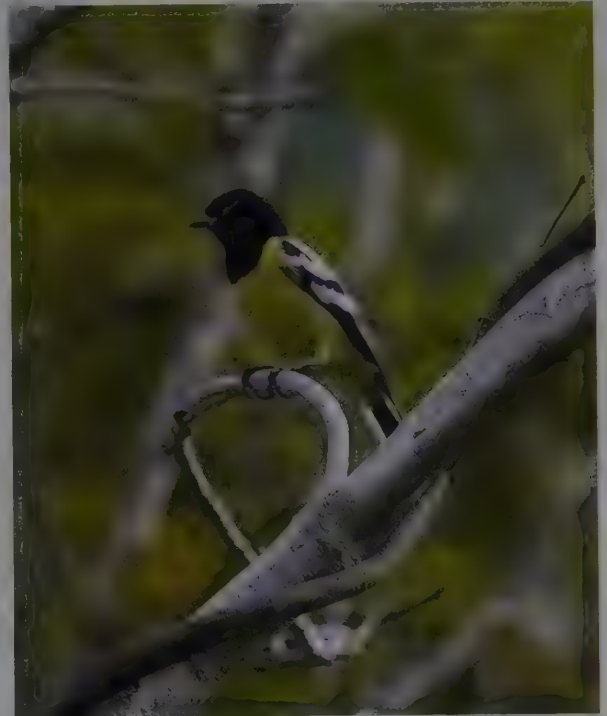
and Lanzarote, which suffers poor breeding success and may be susceptible to increasing desertification of these islands, and the Borodino Islands race *orii* of the Varied Tit, now presumed extinct following widespread habitat loss.

At the other extreme, a number of parids have extended their range in recent years. These include the Black-capped Chickadee in the eastern USA; the Sombre Tit in southern Europe, possibly responding to the warming climate; the Great Tit north of the Arctic Circle, including a population maintained in winter by human provisioning; and the Yellow-cheeked Tit in southern Asia, where its range now includes Hong Kong.

Globally, the Paridae exemplify the need for detailed data for the purpose of conservation assessments. As indicated above, the status of several African species may be more precarious than is currently recognized, because of the lack of census data indicating changes over time. Indeed, to the Red-throated and Miombo Tits we could perhaps add the White-bellied Tit, whose range appears to have contracted in parts of Kenya, and the White-backed Black Tit, which has not been recorded in Eritrea for 50 years.

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The **White-naped Tit** is endemic to India, occurring mainly in the arid north-eastern states of Gujarat and Rajasthan, but also in the southern states of Karnataka, Kerala and Tamil Nadu. In the south it is rare, and even in the stronghold of Kutch (Gujarat) it is sparsely distributed. It usually inhabits Acacia thorn-scrub, which has been degraded and fragmented through clearance for agriculture, industry, firewood, charcoal, and other human uses. The total population size is therefore assumed to be small and declining, and the species is listed as **Vulnerable**.

[*Parus nuchalis*,  
Raydhanzhar, Kutch,  
Gujarat, India.  
Photo: Adesh Shivkar]





*ssp. lugubris*

*ssp. hyrcanus*

*ssp. palustris*

*ssp. hypermelaenus*

*ssp. dubius*

*ssp. hensoni*

*ssp. montanus*

*ssp. kamtschatskensis*

*ssp. atricapillus*

*ssp. turneri*

*ssp. kleinschmidti*

*ssp. songarus*

6

7

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*ssp. varius*

*ssp. owstoni*

*ssp. rufescens*

12

13

*ssp. castaneiventris*

*ssp. barlowi*



Genus *POECILE* Kaup, 1829

## 1. Sombre Tit

*Poecile lugubris*

**French:** Mésange lugubre      **German:** Balkanmeise      **Spanish:** Carbonero Lúgubre  
**Other common names:** Caspian/Elburz Tit (*hyrcanus*)

**Taxonomy.** *Parus lugubris* Temminck, 1820, Dalmatia and Hungary.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has been considered conspecific with *P. davidi*. Race *hyrcanus* has been treated as a separate species on basis of differences in voice and breeding behaviour and apparent absence of intergradation with neighbouring *dubius* and *anatoliae*; close to former race in structure and plumage and to latter in plumage, but vocal characters and breeding biology similar to those of *P. montanus* (especially of “*songarus* group”); further study required. Geographical variation largely clinal, size decreasing from N to S, crown and bib darker from S to N & E, and underparts increasingly paler from W to E; described race *splendens* (from E Romania and E Bulgaria) somewhat larger and paler than nominate, but considered better synonymized with it. Six subspecies recognized.

**Subspecies and Distribution.**

*P. l. lugubris* (Temminck, 1820) – extreme NW Croatia S to Albania, and C & S Romania S to E Bulgaria and N Greece, also Crete.

*P. l. lugens* (C. L. Brehm, 1855) – C & S Greece.

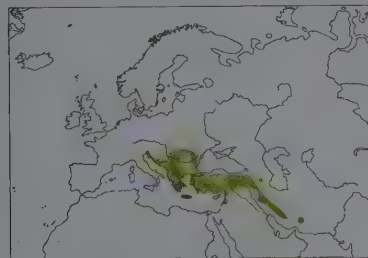
*P. l. anatoliae* (E. J. O. Hartert, 1905) – Asia Minor, W Georgia, extreme S Armenia and Levant (S to N Israel).

*P. l. hyrcanus* Zarudny & Loudon, 1905 – SE Azerbaijan and N Iran (Elburz Mts).

*P. l. dubius* (Hellmayr, 1901) – W Iran.

*P. l. kirmanensis* (Koelz, 1950) – SE Iran (Kerman).

**Descriptive notes.** 14–15 cm; 16–19 g. Large, large-billed, grey-brown tit with blackish cap and bib. Male nominate race has upper lores and crown to nape blackish-brown to dark sooty brown, lower lores, cheek and ear-coverts white, becoming buffish on neck side; upperparts mostly dull ash-brown, slightly greyer on uppertail-coverts; tail grey-brown, tinged olive-grey, fine whitish fringes on outermost feathers; upperwing-coverts as upperparts, but greater coverts fringed buffish or paler, alula dark grey to blackish; flight-feathers dark grey, narrowly fringed pale greyish-buff, tertials similar but more broadly fringed



greyish to buffish-white; chin, lower cheek and throat sooty brown, forming bib (with lower border poorly defined); underparts whitish, washed buffish on breast and flanks (duller off-white and greyish on flanks when worn); plumage greyer above and whiter below in E of range (“*splendens*”); iris brown to dark brown; bill dark grey to blackish-horn, with paler or greyish cutting edges of upper mandible; legs dark grey to bluish-slate. Differs from *P. palustris* mainly in larger size, more robust bill, dull blackish-brown (not glossy black) cap, greyer-tinged brown upperparts, and more black on bib and throat. Female is very like male, but crown variable from blackish-brown (as male) to dark chocolate-brown, bib browner, underparts duller or washed greyer. Juvenile is similar to female, but crown brown or dark grey-brown (as upperparts), whitish cheeks washed buffish or brownish, greater coverts prominently tipped whitish, bib smaller and finely tipped greyish-buff, underparts washed buffish or dingy, to off-white on undertail. Racial variation moderate, but also considerable individual variation: *lugens* is smaller than nominate, male has grey-tinged dark sooty-brown crown and bib, female paler or greyer-brown; *anatoliae* is as nominate, but crown and bib black (male) or blackish to sooty brown (female) and clearly defined at rear, mantle and scapulars dark olive-brown, underparts whiter, flanks washed cinnamon in fresh plumage; *dubius* has slightly longer and more slender bill than other races, crown and bib velvety black (or tinged brown on female), upperparts paler or sandy-grey, underparts whitish with creamy wash; *kirmanensis* is poorly defined, very similar to previous but upperparts slightly darker and browner; *hyrcanus* is slightly smaller and darker than others, with shorter tail and relatively large bill, has extensive dark chestnut-brown cap to nape and upper mantle, darker brown upperparts (mantle may be tinged pinkish), tertials lack broad pale edges, bib darker than crown (slightly more extensive in worn plumage) and lower edge poorly defined, underparts washed rusty or pinkish-buff in fresh plumage (whiter when worn). VOICE. Call notes include thin or nasal “si” or “zee” as contact, or extended into longer and slightly declining cadence of “si-si-si-si-si-si”, or may conclude with short chattering “ttrrrr”, harsher “chit” also given in bursts of sharper chattering notes, “chit-cht-cht-cht-cht”, and may be introduced by thin “si”; other combinations of calls include “tsi-tsi-tsi-zee”, “tsi-tsi-tsi-tsi-tsi-tsi-ttrrr”, or “sirrah”, “sit-sit-sirrah” and “sisi...cheerrrrrr”, “sip” or “snipp” in flight; alarm call a loud, prolonged and hurried chattering “ttrrrrrr” or “chrrrrrr” like that of sparrow (*Passer*), sometimes preceded by slower insect-like “si si” or “zi zi ttrrrr” or “tiz-ze-ze-ze-ze-ze” (which may be given in isolation from chattering note); during courtship, begging call of female “che-ka-di-che-ka-di-tsi-tsi”, and soft “tsi-tsi-tsi” by both birds during mating; female on nest gives threatening snake-like hissing; alarm call of race *hyrcanus* a short, nasal “chev” or “tshef” repeated several times or more prolonged. Song, from top of tall tree, given with varying pitch or emphasis usually for short period prior to egg-laying, a series of “tea-cher”-like phrases, recalling songs of both *Parus major* and *Periparus ater*; also, low-pitched, hard “chip-chip-chip” repeated a dozen or more times, shorter “cheeu-cheuu-cheuu” or stident or slightly gruff or buzzing “chiz-ze, chiz-ze”, or variations e.g. “tu-ch-zai, tu-ch-zai, tu-ch-zai”; song of *hyrcanus* a clear and slightly attenuated “tiu” repeated up to five times.

**Habitat.** Inhabits dry maquis areas of scattered trees and bushes, including olive (*Olea*) groves, wild plum (*Prunus*) orchards and other fruit trees, e.g. wild pear (*Pyrus amygdaliformis*) and vineyards, also parkland areas of open oak (*Quercus*) forests including scrub oak, beech (*Fagus*), wil-

lows (*Salix*) and poplars (*Populus*); also conifers, particularly spruce (*Picea*) and cedars (*Cedrus*), especially in areas of rocky limestone hills. From sea-level around Mediterranean, up to 2300 m in Turkey and N Iran (Elburz Range); in N Israel breeds at 750–1700 m; in Azerbaijan not found below c. 550 m.

**Food and Feeding.** Small invertebrates and larvae, including beetles (Coleoptera), grasshoppers (Orthoptera), bugs (Hemiptera), flies (Diptera), bees and wasps (Hymenoptera), ants (Formicidae), damselflies (Odonata), lacewings (Neuroptera), moths (Lepidoptera), spiders (Araneae), woodlice (Isopoda) and snails (Gastropoda); also seeds, mainly of Leguminosae; in captivity, frequently stores food. Usually in pairs in breeding season; often in small groups in autumn and winter, occasionally solitary in winter. Shy, unobtrusive. Forages in lower branches of trees and shrubs, occasionally briefly on ground, but usually returns to bush or branches of tree with food items; in S Caucasus forages mainly in canopy of deciduous trees. Active but generally less acrobatic or agile than other tits. Climbs tree trunks like a nuthatch (Sittidae), and occasionally pursues insects in flight in manner of flycatcher (Muscicapidae). Food items held in foot and hammered open with bill, also seeds wedged in bark before being opened; seedheads, including those of herbs, torn open in manner of a finch (Fringillidae).

**Breeding.** Season Mar to early Aug; mostly single-brooded but two broods not uncommon, and double-brooding frequent in Israel. Monogamous; territorial, during breeding most time spent within 150 m of nest, territorial conflicts rare. Male courtship-feeding female, display includes wing-shivering and begging calls. Nest, built by female, a cup of wool, plant material, bark strips, animal hair and feathers, placed up to 7 m from ground in hole in tree, often in rotting wood in fruit tree (some evidence that race *hyrcanus* excavates hole), also among rocks on bank; will use nestbox; territory in oak woodland in Croatia 300–400 m in diameter. Clutch 5–7 eggs; incubation by female, period 12–14 days; both sexes feed chicks, nestling period 17–22 days; defends nest from predatory ants *Liometopum microcephalum* in oaks in Balkans by collecting those passing near nest entrance and crushing them against bark (which apparently causes alarm pheromone to be released by ants, deterring others from entering hole).

**Movements.** Resident, but some evidence of altitudinal movements in Zagros Mts (Iran) and N Israel; some apparent immigration from Lebanon and Syria into N Israel, where commoner in winter down to 600 m on Mt Hermon and Golan Heights; also wanders in autumn and winter to C Turkey and has occurred NE Iraq. Vagrant in N Italy.

**Status and Conservation.** Not globally threatened. Generally uncommon or locally common. Fairly common and widespread in Greece and W Turkey (less common inland), absent from Ionian islands except Corfu, also breeds on Lesbos, Samos and Kythira; rare on Crete; in Iran, scarce in NW but common in Zagros Mts of W & S; rare or sporadic throughout Caucasus; very scarce in Lebanon; locally common in N Israel. European breeding population 100,000–500,000 pairs; largest numbers in Bulgaria, although there has recently been a significant decline. Has recently extended range N in Romania (into Transylvania). Breeding densities of 9–10 pairs along 7-km stretch of sparse montane juniper (*Juniperus*) forest in Transcaucasia and 5–6 pairs along 4-km transect; in S Azerbaijan, pairs usually 0.5–2 km apart.

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## 2. Marsh Tit

*Poecile palustris*

**French:** Mésange nonnette      **German:** Sumpfmieise      **Spanish:** Carbonero Palustre  
**Other common names:** Eurasian Marsh-tit (*palustris*); Asian Marsh-tit (*brevirostris*); Black-bibbed/Chinese/Burmese Marsh-tit (*hypermelaeus*)

**Taxonomy.** *Parus palustris* Linnaeus, 1758, Europe = Sweden.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has hybridized with *P. montanus* and *Parus major*. Race *hypermelaeus* sometimes considered a separate species; also, *brevirostris* (with other E Palearctic forms) might represent a further species, though genetically not apparently very different. Race *kabardensis* has in the past been referred to by older name of *brandtii*, but type specimen of latter now lost and, since written description seems incompatible with present species, that name is regarded as indeterminate. Many races described, but most geographical variation clinal, with e.g. decreasing size and increasing intensity of upperpart colour from E to W; also, races intergrade widely, and *stagnatilis* and *kabardensis* sometimes included within nominate, and *jeholicus* sometimes merged with *hellmayri*. Other proposed races are *altaicus* (from Altai and W Sayan Mts) and *crassirostris* (SE Russia, NE China and Korea), both synonymized with *brevirostris*; as extreme view, species has been considered possibly monotypic, with high degree of variation within populations. Further research and review required, particularly of relationship between *hellmayri* and *hypermelaeus*. Eleven subspecies currently recognized.

**Subspecies and Distribution.**

*P. p. dresseri* (Stejneger, 1886) – S Britain (C & S England, Wales) and W France.

*P. p. palustris* (Linnaeus, 1758) – N & C Europe from S Scandinavia S to N Iberia, E to C Poland, W Balkans and Greece.

*P. p. italicus* (Tschusi & Hellmayr, 1900) – French Alps, Italy and Sicily.

*P. p. stagnatilis* (C. L. Brehm, 1855) – E Europe E to S Urals and NW Turkey.

*P. p. kabardensis* (Buturlin, 1929) – Caucasus and NE Turkey.

*P. p. brevirostris* Taczanowski, 1872 – SC & SE Siberia, N Mongolia, NE China (W & N Manchuria, Liaoning) and N Korea.

*P. p. jeholicus* (O. Kleinschmidt & Weigold, 1922) – NE China (N Hebei).

*P. p. hellmayri* Bianchi, 1902 – E China (Hebei S to Shandong and Jiangsu) and S Korea.

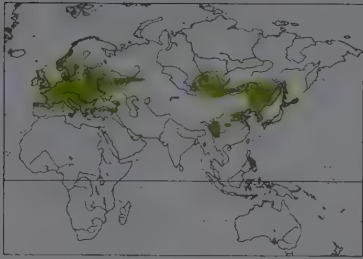
*P. p. hypermelaeus* Berezowski & Bianchi, 1891 – NC & S China (S Gansu & SW Shaanxi, C Hubei, and SW Sichuan S to NE Yunnan and NW Guizhou) and W Myanmar.

*P. p. ernsti* (Yamashina, 1933) – Sakhalin I.

*P. p. hensoni* (Stejneger, 1892) – S Kuril Is and N Japan (Hokkaido).

**Descriptive notes.** 11–12 cm; 8.9–15 g. Medium-sized, glossy black-capped, brown-backed tit with small blackish bib. Nominative race has forehead, crown and crown side (down to lower level of eye) to nape black, crown feathers glossy; upperparts, including upperwing-coverts, dull buffish-





**Food and Feeding.** Largely small invertebrates, including flies (Diptera), bugs (Hemiptera), stoneflies (Plecoptera), caddis flies (Trichoptera), bees and wasps (Hymenoptera), beetles (Coleoptera) springtails (Collembola), aphids (Aphidoidea), lacewings (Neuroptera), moths (Lepidoptera), ants (Formicidae), mites (Acari), spiders (Araneae), and small snails and slugs (Gastropoda). Also much vegetable matter, including fruits of raspberry (*Rubus*), crab apple (*Malus*) hawthorn (*Crataegus*), pear (*Pyrus*), cherry (*Prunus*), mulberry (*Morus*) and elderberry (*Sambucus*), and wide range of seeds, including those of coniferous and deciduous trees (principally cones and beech mast), and wide variety of vascular-plant seeds, e.g. of thistles (*Cirsium*) and honeysuckle (*Lonicera*), also cereal plants and other grasses; also flowers and buds of willow (*Salix*), alder, birch, aspen (*Populus*), maple (*Acer*) and plum (*Prunus*), and sap of aspen, birch and maple; generally infrequent at birdtables unless in immediate vicinity of woodland, but, where present, takes variety of foods, including sunflower and hemp seeds. Commonly stores food items (more frequently in Europe than in Britain), principally seeds but also some invertebrates (e.g. slugs), usually between Aug and late Feb, behind loose bark, in holes in trees, in wood piles, under moss clumps, among leaf litter and in holes in ground; in C Norway single individual stored c. 80,000 seeds during Aug-Dec, and individual consumption estimated at minimum of 43 seeds per hour. Food stores relocated by memory, rather than by random search, and exploits earliest stored food first. Occurs in pairs throughout year, but occasionally solitary; also (mostly) juveniles not yet with territory) in mixed-species foraging flocks or in small single-species groups of up to 20 individuals, but generally less social than other tits. Forages at all levels in trees and lower vegetation, but prefers middle to lower levels of trees and shrubs. Actively searches foliage and slender branches, and hangs from buds and cones; vigorously strips lichen and moss in search of insect prey, and pulls seeds from thistle-heads; occasionally hovers briefly; in non-breeding season frequently forages on ground in fallen leaves and among dead plants, including on snow-covered ground where

er and more round-headed appearance, glossy upper mantle), generally no pale wingpanel (individuals), also has centres of greater coverts, fuller, and bib slightly smaller or neater; from *P. sinciped* cap, browner upperparts, less black on nape, but has sooty-black or brownish crown to nape; wings of flight-feathers and tail warmer brown, less obscured by white tips, and underparts whiter, but relatively little, mainly in size and plumage. *P. montanus* (less grey) upperparts than nominate, upperparts, and pale buffish-brown neck side, breast and belly more buffish-brown than nominate, but has slightly paler buff upperparts (boundaries), whiter on side of breast and flanks; slightly longer tail, and paler or greyer upperparts, but restricted or absent; *brevirostris* differs from nominate by buff on underparts (but tinged rufous in E of range), forming slight panel on closed wing, pale edges of wing coverts, and paler on underparts, but nominate, but with paler ash-grey or lightly buffish-brown bib; *hensoni* is as last, but slightly browner upperparts (closer to buffish-brown than nominate), buffish below, becoming whiter in worn plumage, and paler, with smaller tail/wing index; *montanus* has a dark brown flight-feathers narrowly edged with buff, and a ragged crest, black or blackish-brown bib on throat, and lower throat, underparts whitish except for a narrow buffish-brown line on throat. Wide variety of call notes, most commonly a 'psittichiu sippichiu', or 'psiu', or slightly different 'see' often repeated several times, or a 'chit' alarm includes sharp 'pit-zit-zit-its', chattering 'ar-tchar' (often preceded by 'pichuu'), and defence of nest or young female gives hissing 'chit' or 'chit' notes. Song, most frequent between mid-evening and dawn, consists of sharp monosyllabic notes, 'schip schip schip' (often preceded by 'chit' or 'chit'), 'chi chi', may be followed by 'swi-swit' (often by *P. montanus*), may continue with longer 'pitchawee-pitchawee' or 'chip-wichu-wichu-wichu' (often by *P. montanus*), or 'chip-wichu-wichu-wichu' (often by *P. montanus*). Male has repertoire of c. 20 song variations, and also give mixture of phrases from different trills, but song and calls vary little throughout the day, only repetition of a single phrase. Subsong is a main song interspersed with whispering and

**Bibliography.** Barnes (1973), Brazil (1991), Brown & Grice (2005), Cheng Tsohsin (1987), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Eck (1980), Etchécopar & Hûe (1983), Flint *et al.* (1984), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Gorman (1996), Haftorn (1997), Hagemeyer & Blair (1997), Handrinos & Akriotis (1997), Harrap & Quinn (1996), Harrison (1982), Hariet (1905, 1923), Hollom *et al.* (1988), Hûe & Etchécopar (1970), Johansen (1944), King *et al.* (1975), Lee Woo-Shin *et al.* (2000), MacKinnon & Philipps (2000), McCarthy (2006), Meyer de Schauensee (1984), Morley (1953), Nilsson, J. (1989), Nilsson, S.G. (1984), Perrins (1979), Porter *et al.* (1996), Rasmussen & Anderton (2005), Robson (2000), Rogacheva (1992), Smythies (1986), Svensson *et al.* (1999), Tomek (2002), Vaurie (1959), Wernham *et al.* (2000).

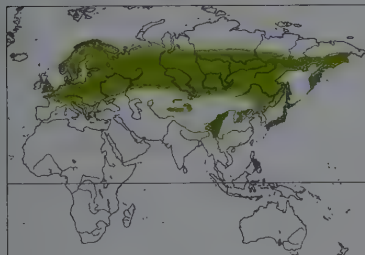
*Poecile montanus*

**Other common names:** Songar Tit (*songarus* group)

*P. m. restrictus* (Hellmayr, 1900) — Japan



*P. m. songarus* (Severtsov, 1873) – SE Kazakhstan and Kyrgyzstan (C & E Tien Shan) E to NW China (NW Xinjiang).  
*P. m. affinis* Przevalski, 1876 – NC China (NE Qinghai, Gansu, N Sichuan, Ningxia and SW Shaanxi).  
*P. m. weigoldicus* (O. Kleinschmidt, 1921) – SC China (E Xizang, SE Qinghai, W Sichuan and NW Yunnan).  
*P. m. stoetzneri* (O. Kleinschmidt, 1921) – NE China (SE Nei-Mongol and Shanxi E to Hebei and Henan).



**Descriptive notes.** 11–12 cm; 8–15 g. Medium-sized, broad-headed tit with pale panel on closed wing. Nominative race has forehead to side of crown (down to lower edge of eye), nape and uppermost mantle dull blackish; rest of upperparts, including lesser and median upperwing-coverts, pale grey-brown, greater coverts similar but with darker brown centres; alula and flight-feathers dark greyish, primaries finely fringed pale, secondaries broadly fringed pale or whitish-buff (forming prominent panel on closed wing), tertiaries as secondaries but centres darker or browner; tail greyish-black, outer webs with broad pale buff

fringes; lores, cheek and ear-coverts white, creamy buff on sides of nape; chin and throat dull black, forming ill-defined bib (with whitish tips on side of throat and along lower border); underparts off-white or dull whitish-grey, in fresh plumage with pinkish-buff on breast side and flanks; in worn plumage, upperparts paler or greyer, wingpanel occasionally less prominent, bib slightly larger, and underparts whiter except for warm buffish flanks and undertail-coverts; iris brown to dark brown; bill dark blue-black or blackish, paler edges of both mandibles; legs dark greyish-blue. Differs from *P. palustris* in larger-headed appearance, slightly more extensive dull (not glossy) cap reaching to upper mantle, pale wingpanel, also darker or blackish (not dark brown) centres of greater coverts, remiges and rectrices, slightly larger bib, and more extensively deeper buff on underparts. Sexes alike. Juvenile is similar to adult, but crown duller brown-black, upperparts colder grey-brown, cheeks and ear-coverts pale creamy white or tinged buff, bib slightly paler brown and with white flecks at sides, whiter underparts with buff wash on flanks and undertail-coverts; bill browner than adult, with yellowish cutting edges. Races differ mainly in size, tail length and colour of upperparts and underparts: *kleinschmidtii* is smallest and darkest race, with browner upperparts, creamy-buff cheek to neck side, extensive buff-brown on underparts, flanks olive-brown, bib appears fairly large; *rhenanus* is similar to previous, but upperparts paler, more drab brown, centre of breast and belly white with pale greyish-buff wash, breast side, flanks and undertail-coverts tinged cinnamon-buff; *salicarius* is very similar to last, but with slightly duller brown upperparts, creamy-white cheek to neck side, and underparts with buff or greyish-buff wash only on flanks; *borealis* has blackest crown and nape (may be slightly glossy) of all races, grey upperparts, white cheek to neck side, whitish or pale buff edges of greater coverts (as edges of secondaries and tertiaries), slightly smaller black bib, white or creamy-white breast centre to vent, with pinkish-buff on flanks and undertail-coverts; *uralensis* is similar to previous, poorly defined, has paler or greyer upperparts, white edges of secondaries and tertiaries, mostly whitish underparts, pale pinkish-grey tinge on flanks; *baicalensis* is very similar to last, but has buffish wash on underparts, slightly longer tail; *kamtschatkensis* has very pale greyish-white upperparts, broad white edges of greater coverts, secondaries and tertiaries, outer rectrices broadly edged white, blackish bib slightly larger, underparts mostly white or faintly washed creamy; *anadyrensis* is poorly differentiated, intermediate between previous two; *restrictus* is darker than *kamtschatkensis*, with crown duller and browner, mantle and back grey-brown with sandy tinge, underparts with slightly heavier buffish wash; *sachalinensis* is similar to last but paler or greyer, more noticeably on underparts; *songarus* is slightly larger, with longer bill, slightly rounded tail (outermost feather up to 6 mm shorter than others), dark chocolate-brown crown, warmer, more ochre-brown upperparts, wingpanel indistinct, rear ear-coverts and side of neck washed buffish-brown, some brownish on bib, pinkish-cinnamon wash on flanks; *stoetzneri* is similar to previous, but smaller, somewhat longer-tailed, crown to nape browner, bib darker, upperparts slightly paler, and cinnamon wash on flanks less pinkish; *affinis* is slightly darker than previous, wingpanel indistinct; *weigoldicus* is similar to last, but crown more blackish-brown, upperparts slightly darker, flanks tinged browner. **VOICE.** Generally less vocal than *P. palustris*, and with fairly restricted vocal repertoire. Contact call 2–4 short high-pitched “zi-zi” or “tsi-tsi” notes followed by longer series of more nasal “tchaa tchaa tchaa” or “tchay tchay tchay”, and harsh or scolding notes which may also be given as rolling “tchurrurr”; same notes but at higher pitch, louder and with faster delivery given in alarm; high-pitched “pi” followed by lower “pa” during aggressive encounters; also shorter high “zi”, “sit” or “zit” contact notes when foraging in family group, occasionally extended into “zisi” or “zissit” and thin, drawn-out and downslurred “dzee”, “zieh” or “ziet”; other alarm notes include harsh “pett” or “kett” several times in succession, and “chik-ik-ik-ik” like that of a sparrow (*Passer*), and during courtship a soft descending “didededa” by female and rapid “zi-zi-zi-zi” by male; call of race *songarus* slightly harsher, variable, “psit-zer” or “psit dzee dzee” repeated, also nasal “chiur” and sharp “chit”; *affinis* also gives a series of “sip-sip-sip...” calls, also a more slurred “tsiur-dzee-dzee” and a short, chattering series of “chip-ip-ip-ip” notes; calls of *stoetzneri* similar those of *affinis* but variable, with dissyllabic “ps-zur ps-zur” or longer “tsi-stip-dzah” or “tchip-dzee-dzee” and “dzeeh-dzeeh-dzee”. Song, mostly in early to middle morning throughout year (most frequent in late winter and early spring, and again in late summer), varies considerably between lowland and montane populations, throughout lowland Europe mostly 3–5 downwardly inflected and drawn-out piping “piu piu piu” or “duu duu duu” notes, reminiscent of introductory notes of Wood Warbler (*Phylloscopus sibilatrix*) song; in C Europe (Alps E to N Croatia, also Tatra Mts of Poland–Slovakia), song of alpine populations (mostly nominate race) up to 7 or occasionally 10 soft and monosyllabic or evenly pitched notes as “duh duh duh duh” or with softer “ü ü ü ü”, occasionally as higher-pitched “pe-pe pe-pe pe-pe pee pee”, given in late winter and spring only, and individuals in hilly and submontane areas may give modified or intermediate-type song with slight decline in pitch; in overlap areas at 1000–1550 m, both song types can occur together. In Fennoscandia and E Europe to E Asia song mostly of modified type, with phrases of lowland and montane songs either constant or slightly falling in pitch, in Japan appears to be of two types, in N similar to that of montane areas of C Europe, but in S two or three ringing whistles repeated several times, e.g. “pee-si pee-si pee-si pee-si pee”. Also has weak series of musical, warbling and chattering notes as subsong; also an infrequently heard (apparently mostly in Britain) series of rich warbling notes, similar to several notes of Common Nightingale (*Luscinia megarhynchos*), mixed with softer notes, given in short snatches and not far-carrying. Singing by female infrequent.

**Habitat.** Lowland, submontane and montane forests and woodlands, principally coniferous forests of pine (*Pinus*), larch (*Larix*) and spruce (*Picea*), and in Siberian taiga most frequently in steppe-forest of Siberian stone pine (*Pinus sibirica*), and often in dense and damp areas, especially *Sphagnum* bogs and areas of willows (*Salix*) or alders (*Alnus*) and on tundra edge. In Europe also occurs

in willows, alders and more shrubby vegetation, including elder (*Sambucus*) patches, edges of woods, copses, and hedges, especially along rivers and beside lakes. In Tien Shan occurs in montane conifer forest, also mixed broadleaf woodland with well-developed undergrowth and willow thickets, and lowland to submontane birch (*Betula*) forest; also in riverine and swamp thickets, and occasionally in osier (*Salix*) beds. Occurs from sea-level to tree-line, in Europe up to c. 2000 m, in Altai Mts up to 2300 m, between 800 m and 2400 m in Japan (C Honshu); in China, at 1830–2745 m in Tien Shan, at 2200–4275 m in Sichuan (but breeding not confirmed above 2400 m), and present in summer at 3350–4000 m in Qinghai and at 3840 m (in Mar) and 3960 m (in Jul) in Xizang.

**Food and Feeding.** Mostly invertebrates and larvae, also vegetable matter. In breeding season includes flies (Diptera), lacewings (Neuroptera), mayflies (Ephemeroptera), caddis flies (Trichoptera), bees and wasps (Hymenoptera), ants (Formicidae), beetles (Coleoptera), bugs (Hemiptera), moths (Lepidoptera), scale insects (Coccoidea), centipedes (Chilopoda), spiders (Araneae), harvestmen (Opiliones), mites (Acari), snails (Gastropoda) and earthworms (Oligochaeta). In non-breeding season also grain, principally wheat (*Triticum*), oats (*Avena*), maize (*Zea*) and barley (*Hordeum*), also seeds of burdock (*Arcium*), cowberry, cranberry and bilberry (*Vaccinium*), bramble and raspberry (*Rubus*), snowberry (*Symphoricarpos*), honeysuckle (*Lonicera*), poppy (*Papaver*), rose (*Rosa*), buckthorn (*Rhamnaceae*), and various other plants e.g. hedge woundwort (*Stachys sylvatica*), also (according to availability and abundance) fruits of oak (*Quercus*), rowan (*Sorbus*), ash (*Fraxinus*), birch, alder (also buds), juniper (*Juniperus*), lime (*Tilia*), maple (*Acer*), spindle (*Euonymus*), beech (*Fagus*) and conifer seeds (extracted from cones), also aspen (*Populus*) and willow catkins, pollen of aspen, and sap of birch, maple and aspen. Diet of adults throughout summer divided almost equally between plant and animal food, but amount of plant food increases to c. 75% in winter; nestling diet similar to that of adults, but initially more larvae, principally caterpillars. Stores food behind loose bark, under branch, in bud capsules or in lichen, rarely in ground in steep bank; in S Norway most food cached in Aug–Oct, and at one study site 94.8% of stored items were eaten during winter months; in NW Russia recorded as storing up to 200 items per day in winter and over 4700 items per day in spring, providing estimated annual total of 460,000 items (sufficient for 2–3 times the energy requirement to survive the winter). Usually in pairs, sometimes solitary; sometimes small groups of up to six (in N populations usually adult pair with unrelated juveniles), which form in late summer and disperse in spring; within groups, social structure complex, with dominance hierarchy of males over females and adults over juveniles, social rank affecting access to food and foraging areas (lower-ranking individuals forced to feed in less optimal sites); group frequently becomes basis for mixed-species flocks with addition of conspecifics, nuthatches (Sittidae), Eurasian Treecreeper (*Certhia familiaris*) and Goldcrest (*Regulus regulus*), but usually only where these coincide within territory. Actively forages in middle to lower levels of trees and shrub layer; investigates branches (including undersides), thin twigs and conifer and larch needles, hangs from vegetation and climbs vertical trunks by fluttering, occasionally hovers or pursues insects in flight; may search in ground cover, e.g. brambles (*Rubus*), bracken (*Pteridium*), thistles (*Cirsium*) or hemp-nettles (*Galeopsis*), but rarely descends to ground. Most food items collected from vegetation, and rarely (much less than *P. palustris*) picks or hammers vegetation to extract concealed prey; occasionally holds berries and seedheads of plants under foot and removes seeds. Infrequently visits birdtables. In studies in S England, individuals made up to 1100 foraging visits daily to trees, and during mid-winter estimated to require an average-sized insect every 2.5 seconds in order to maintain condition.

**Breeding.** Season Apr–Jul; one brood. Monogamous; lifelong pair-bond. Territorial; partners remain together within or close to territory (within larger foraging territory) throughout year. Display includes singing and chasing by male, and bowing and wing-shivering by both sexes; male courtship-feeds female both at nest and away from it, and this usually accompanied by begging calls by female and rapid trilling by male. Nest built by female, mostly of bark or wood strips, grass, plant fibres, animal hair and feathers (rarely, moss included), placed in hole or crevice up to 3 m (often less than 1 m, exceptionally to 10 m) from ground in rotting tree trunk or old stump; hole excavated by both sexes, or may adapt existing one, e.g. woodpecker (Picidae) hole, or sometimes drey of squirrel (Sciuridae) used; rarely, nestbox used; territory size varies according to habitat, 5–15 ha. Clutch 5–9 eggs; incubation by female, sometimes starting before clutch complete, incubation period 13–15 days; chicks fed by both sexes, nestling period 17–20 days; young dependent on adults for further 12–15 days, dispersing after 20 days. Longevity 8 years 11 months.

**Movements.** Mainly resident; race *songarus* a short-distance altitudinal migrant, and N populations dispersive and occasionally eruptive; in Europe generally keeps within 5 km of natal area and movements beyond 50 km exceptional, but includes ones up to 167 km in UK and 370 km from Germany to N France. N populations (mostly race *borealis*) E from Finland sedentary when food available, but regularly disperse randomly, most moving S from late Jul to early winter; in years of poor cone crop movements much larger, and thousands of individuals (mostly juveniles) move S, in Europe reaching Sweden and S Norway (up to 600 km SW of place of ringing) between late Aug and early Nov; *borealis* irregular visitor to Britain Sept–May; smaller movements in C Europe, when reaches W & NE Hungary. Similar pattern recorded in Siberia, where S populations largely resident and N ones partly migratory; common in wooded steppe from mid-Aug (occasionally late Jul), and birds apparently of race *baicalensis* occur on passage through middle latitudes and notably around Tomsk in Sept–Oct, with return movement through C Siberia in Apr–May (occasionally early Jun). Large-scale movements usually noticeable along river valleys; generally reluctant to cross large areas of water, may gather in several hundreds in trees at strategic places before attempting to cross.

**Status and Conservation.** Not globally threatened. Common in N parts of range, and the commonest tit in Siberia (abundant along R Yenisey) and Mongolia (but population largely dependent on seed crop from Siberian stone pine); locally very common in C China; common in S Japan but uncommon in N (Hokkaido); breeds locally in N Korea, rare non-breeding visitor S Korea; in Europe, locally common in W but becomes less frequent or scarce in S. Estimated European breeding population 5,000,000–6,000,000 pairs, with largest numbers in Scandinavia and Russia. Breeding densities highest in Siberia, where 30–50 birds/km<sup>2</sup> in dark conifer taiga and pine, rising to 119–142 birds along R Chuna, and 20–30 birds in mixed forest and 6–7 birds in lowland floodplain-forest and meadows. Has extended range in N & C Europe, and since mid-1950s has colonized Harz Mts (Germany) and Bohemia and Moravia (Czech Republic); since 1960s has bred in Hungary, first bred N Greece in 1973 and since 1977 has bred N Denmark; on other hand, range in Britain declined by c. 10% since 1970s, possibly as a result of habitat changes through land drainage, changing climate or increased competition from other parids.

**Bibliography.** Barnes (1975), Brazil (1991), Brown & Grice (2005), Cheng Tsohsin (1987), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Eck (1980), Etchécopar & Hùe (1983), Flint *et al.* (1984), Foster & Godfrey (1950), Gibb (1954, 1960), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Gorman (1996), Haftorn (1993a), Haftorn *et al.* (1998), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Harrap & Quinn (1996), Harrison (1982), Hartert (1905, 1921, 1923), Johansen (1944), Jouard (1936), Kvist *et al.* (2001), Lee Wood-Shin *et al.* (2000), MacKinnon & Philipps (2000), McCarthy (2006), Meyer de Schauensee (1984), Perrins (1979), Pravosudov & Pravosudova (1996), Quaisser & Eck (2002), Rasmussen & Anderton (2005), Rogacheva (1992), Svensson *et al.* (1999), Thönné (1962, 1972), Tomek (2002), Vaurie (1957b, 1959), Wernham *et al.* (2002).



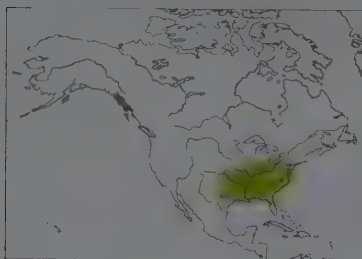
## 4. Carolina Chickadee

*Poecile carolinensis*

French: Mésange de Caroline German: Carolinameise Spanish: Carbonero de Carolina

**Taxonomy.** *Parus carolinensis* Audubon, 1834, Charleston, South Carolina, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. May form a superspecies with *P. montanus* and *P. atricapillus*, possibly also including *P. gambeli* and/or *P. sclateri*. Hybridizes with *P. atricapillus* in narrow band in EC United States (extending from S Kansas E to Pennsylvania, New Jersey and W North Carolina). Geographical variation clinal, with decrease in size and reduction in extent of pale edges of flight-feathers from N to S, also paler from E to W; races thus intergrade widely in overlap areas. Evidence from mitochondrial DNA indicates that E & W populations (which meet approximately along Mississippi–Alabama state lines) have been separated from each other by c. 1 million years; level of divergence does not influence plumage or vocal characteristics, but W populations may meet species status. Four subspecies recognized.

**Subspecies and Distribution.***P. c. atricapilloides* (Lunk, 1952) – SC USA (S Kansas, Oklahoma and N & C Texas).*P. c. agilis* (Sennett, 1888) – SE Oklahoma, SC & E Texas, SW Arkansas and W Louisiana.*P. c. extimus* (Todd & Sutton, 1936) – S Missouri E to Ohio, S Pennsylvania and New Jersey, S to NW Tennessee, NW North Carolina and E Virginia.*P. c. carolinensis* (Audubon, 1834) – N & E Arkansas, S Kentucky and Tennessee E to SE Virginia, S to E Louisiana, S Mississippi and N & C Florida.

**Descriptive notes.** 11.5–13 cm; 9–12 g. Medium-sized, black-capped chickadee with grey-brown upperparts. Nominative race has forehead to crown (including eye area) and nape black; upperparts, including upperwing-coverts, grey or greyish-brown, washed buffish on upper mantle, rump and uppertail-coverts; greater coverts with dark grey centres and pale grey fringes (inner greater fringed paler or buffish-grey), alula and primary coverts blackish, finely fringed pale grey, flight-feathers dark brown, finely fringed greyish-white, longest tertial fringed pale grey or greyish-white; tail dark grey, feathers narrowly edged pale grey, outermost rectrix with white tip; cheek to nape side white, chin and throat sooty black and forming large dark bib (with sharply defined lower edge); centre of breast and belly white or washed buffish, side of breast, flanks and undertail-coverts pale buffish; in worn plumage slightly paler above and below, whitish edges of flight-feathers duller and narrower, and flanks greyish-buff; iris dark brown; bill black or dark bluish-black; legs dull slate-grey. Differs from *P. atricapillus* in slightly smaller size and shorter tail, smaller-headed appearance, somewhat paler upperparts lacking broad white edges on uniformly grey greater coverts, sharply defined lower edge of black bib, buffish (not olive) on breast side, cinnamon-buff on flanks. Sexes alike. Juvenile is very similar to adult, but crown and bib duller or browner, and underparts more uniformly dull buffish. Races differ mainly in size and in depth of plumage coloration: *extimus* is slightly larger than nominate but otherwise poorly differentiated, has slight olive tinge in upperparts, edges of greater coverts buffish-grey, broad edges of flight-feathers slightly paler or whiter, and flanks slightly deeper buff; *atricapilloides* is similar to previous, but upperparts paler/greyer, greater-covert edges whitish-grey, and underparts whiter or creamier buff (whitest in worn plumage), with less buff on flanks; *agilis* is similar to last but slightly smaller, greater-covert edges buffish-grey, narrower pale fringes of flight-feathers (may be tinged buffish on secondaries), and less buff on flanks (may be tinged greyish). Voice. Most frequent call a high-pitched “chic-a-dee”, similar to that of *P. atricapillus* but usually with faster delivery and often run into “chick-a-dee-dee-dee”; also repeats “dee” note in sharp series of scolds, occasionally preceded by or interspersed with harsh “chrrrrrrrrrr”; contact call a thin “tsit” or “psit”, often in series or when flock-members agitated; also, a thin “seet” and a soft twittering “sisisisisisi”; a series of soft and seemingly random notes, often used in aggression, “spee-dee-dee-dee-dee”. Song, throughout year (most frequently in winter and spring), begins with high-pitched “fee” note and continues as a 4-note “see-bee-see-bay”, with first and third notes higher than other two; also variations, e.g. “see-bee-bee” and “tsee-bee-tseebay”.

**Habitat.** Open broadleaf woods, mostly along rivers, streams and canals, also swamp-forest and secondary forest, scrub, and large wooded suburban gardens and parks; in S of range occurs in cypress swamps and edges of pine (*Pinus*) woodlands. Generally in lowlands, but to 850 m in C Texas and to 1400 m in Pennsylvania, 1525 m in Virginia and generally below 1380 m in North Carolina, but to 1850 m where *P. atricapillus* absent.

**Food and Feeding.** Food mostly small invertebrates and their larvae and eggs, including moths (Lepidoptera), bugs (Hemiptera), bees, wasps and ants (Hymenoptera), aphids and leafhoppers (Homoptera), spiders (Araneae); also seeds, especially of poison ivy (*Rhus radicans*), blackberry (*Rubus*), blueberry (*Vaccinium*), honeysuckle (*Lonicera*), mulberry (*Morus*) and Virginia creeper (*Parthenocissus quinquefolia*). Stores food, mostly seeds, nuts and invertebrates, in caches behind loose tree bark, on undersides of branches, in holes in rotting trees or in plant stems. Usually in pairs or small groups, and in non-breeding season may join larger mixed-species foraging flocks; autumn juveniles form loose roaming flocks. Forages in trees and thickets, usually along edges of woodland, acrobatically examining upper and undersides of leaves, twigs and branches and searching among smallest twigs, also bark on trunks of trees; rarely descends to ground. Not infrequently visits feeders.

**Breeding.** Season mid-Feb to early Jun; one brood. Monogamous, with lifelong pair-bond. Territorial, but some nests close together (c. 8 m apart); highest-ranking males and females that survive winter establish territory within non-breeding territory, and lower-ranking individuals forced to depart, although some males may be tolerated as floaters. Courtship includes wing-shivering by both partners, begging calls by female, and feeding of female by male. Nest built by female, mostly of moss, bark strips, grass, plant fibres, animal hair and feathers, extra material added after laying (forming large loose flap, which covers eggs when she is away from nest), placed up to 12 m (usually below 5 m) above ground in hole in rotting tree or stump, hole excavated by pair or old hole of woodpecker (Picidae) adapted; natural crevice or pipe entrance also used, as occasionally is nest of other hole-nesters e.g. Cliff Swallow (*Petrochelidon pyrrhonota*), and nestboxes. Clutch 3–6 eggs, occasionally up to 9; incubation by female, fed by male both on and off nest, period 12–15 days; chicks fed by both parents, nestling period 16–19 days; young become independent after further 21 days. Hatching success of breeding pairs 83% in S Illinois, 91% in Tennessee and 92% in Pennsylvania; number of young fledged per nest 3.5 in Tennessee, 3.9 in Illinois and 5.8 in SE Pennsylvania. Breeds in first year. Recorded longevity 10 years 11 months.

**Movements.** Resident. Little movement, but singles recorded C Kansas, and vagrant in S Texas, Nebraska, Michigan and S Canada (SE Ontario).

**Status and Conservation.** Not globally threatened. Common throughout range. Some reduction in numbers recorded in N Florida.

**Bibliography.** Anon. (1983b, 1998a), Bent (1946), Bloomfield *et al.* (2005), Bronson *et al.* (2005), Dixon (1961), Doherty & Grubb (2002), Farrand (1985), Frechberg *et al.* (2003), Gill, Mstrom & Mack (1993), Gill, Slikas & Sheldon (2005), Harrap & Quinn (1996), Kaufman (1990), Lucas *et al.* (1999), Mayer *et al.* (1982), McCarthy (2006), Mstrom *et al.* (2002), Parkes (1986b), Pyle (1997), Sibley (2000), Smith (1972), Yunk (2003).

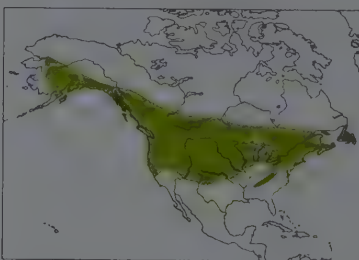
## 5. Black-capped Chickadee

*Poecile atricapillus*

French: Mésange à tête noire German: Schwarzkopfmäise Spanish: Carbonero Cabecinegro

**Taxonomy.** *Parus atricapillus* Linnaeus, 1766, Quebec City, Canada.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. May form a superspecies with *P. montanus* and *P. carolinensis*, possibly also with *P. gambeli* and/or *P. sclateri*. Has been considered conspecific with *P. montanus*, but DNA studies indicate that the two are not closely related genetically. Hybridizes with *P. carolinensis* in narrow band in EC USA (extending from S Kansas E to Pennsylvania, New Jersey and W North Carolina). Geographical variation clinal, and races intergrade widely; paler-flanked birds in S Canada (NC Ontario) sometimes separated as race *anamesus*, but better included within nominate. Nine subspecies recognized.

**Subspecies and Distribution.***P. a. turneri* (Ridgway, 1884) – NW USA (WC & S Alaska) and NW Canada (extreme NW British Columbia).*P. a. occidentalis* (S. F. Baird, 1858) – coastal SW Canada and W USA (S to NW California).*P. a. fortuitus* (Dawson & Bowles, 1909) – inland SW Canada and NW USA (S to NW Idaho).*P. a. septentrionalis* (Harris, 1846) – W & C Canada S to C USA.*P. a. bartletti* (Aldrich & Nutt, 1939) – Newfoundland and Miquelon I.*P. a. atricapillus* (Linnaeus, 1766) – E Canada S to C USA.*P. a. nevadensis* (Linsdale, 1938) – SW USA.*P. a. garrinus* (Behle, 1951) – WC USA.*P. a. praticus* (Oberholser, 1937) – E USA (Appalachian Mts).

**Descriptive notes.** 13–14.5 cm; 9.2–14 g. Medium-sized to large, black-capped and grey-backed chickadee. Nominative race has forehead to crown (including eye area) and nape sooty black; upperparts olive-grey, variably tinged buffish on upper mantle, rump and uppertail-coverts; median and greater upperwing-coverts with dark grey centres, inner two broadly fringed whitish or pale grey, alula and primary coverts blackish, finely fringed pale grey, flight-feathers blackish-brown, finely fringed pale greyish, secondaries with broad white fringes (forming, with greater coverts, a prominent panel), and longest tertial with whitish

fringe and pale grey tip; tail blackish-grey, narrowly edged off-white, outermost two feathers (which slightly shorter than rest) broadly edged white; cheek to side of nape white, chin and throat sooty black and forming large dark bib, sides and lower edge of which broadly tipped whitish (giving irregular edge); white below, breast sometimes washed light buffish, breast side olive-buffish, becoming pinkish-buff (pinkish-grey in spring) on flanks and undertail-coverts, locally (S Canada) with paler flanks (“*anamesus*”); in worn plumage, slightly greyer or duller above and greyish-white below, with whitish edges of wing feathers duller and abraded; iris dark brown or black; bill black or dark brownish-black; legs dull bluish-grey. Differs from *P. carolinensis* in slightly larger size and longer tail, larger-headed appearance, somewhat darker upperparts, broad white edges of greater coverts, broad white edges of inner secondaries and tertials, irregular lower edge of black bib, olive on breast side, cinnamon-buff on flanks and undertail-coverts. Sexes alike. Juvenile is as adult, but crown and bib slightly browner, bib more extensively tipped pale grey at sides, upperparts slightly duller or more brownish, pale base of lower mandible. Races differ mainly in size (particularly wing length), colour of upperparts, extent of pale edges on secondaries, and flank colour: *turneri* is similar to nominate but slightly larger, and upperparts paler buffish-grey, edges of flight-feathers whiter and more extensive, underparts whiter, with sides washed pale buff; *occidentalis* is slightly darker above, with narrower and less distinct whitish edges on remiges and rectrices, duller below, with sides of breast and flanks rich buff (pinkish in fresh plumage); *septentrionalis* has longer wing and tail than nominate, upperparts slightly paler grey with buff wash, flight-feather edges whiter, underparts whiter, with less buff wash on belly and flanks; *fortuitus* is similar to both nominate and previous, with upperparts medium olive-grey, tinged buffish, edges of flight-feathers and tail feathers broader, flanks buffish-tan; *garrinus* is close to last two but paler above, except for brown wash on back, buffish rump, and has broader white edges on flight-feathers and rectrices; *nevadensis* is also similar, but paler grey and less buff on upperparts, with broad edges of remiges and rectrices (all tail feathers fringed white on outer web), and paler below, flanks pale buffish-brown when plumage fresh; *bartletti* resembles nominate, but upperparts darker, edges of wing and tail feathers narrow, duller and washed greyish, and flanks to vent washed buffish-brown (fresh plumage); *praticus* has shorter tail than nominate, and upperparts slightly darker, less buffish, with narrower pale edges of wing and tail feathers, also underparts paler and with more contrast apparent between white centre of breast and belly and dull buff flanks (pinkish when fresh). Voice. Most frequent call “chick-a-dee-dee-dee”, similar to that of *P. carolinensis* but lower-pitched and with slower delivery; also gives “dee” note repeatedly in sharp series of scolding notes; contact call a thin “tsit”, “psit” or “tsleet”, often in series, or when agitated becoming rattling “tsleet-slit-slit-slit-slit”; also, softer “fee-bee” and more individual thin “seet” and a soft twittering “sisisisisisi”; begging call by female to male in breeding season a descending “zee-zee-zizizi-ziu”. Song, throughout year (mostly from early Dec to mid-summer), a clear whistled “fee-bee” or “fee-bee-bee”; responds rapidly to whistled imitations of song.

**Habitat.** Open deciduous and mixed forests and woods. Favours birch (*Betula*) and alder (*Alnus*) and spruce–fir (*Picea–Abies*) and pinyon–juniper (*Pinus–Juniperus*) forests, also willows (*Salix*) and cottonwoods (*Populus*) along river valleys, wooded agricultural areas, orchards, parks and suburban gardens; in non-breeding season found in wider variety of bushed and scrubby habitats. Mostly in lowlands, to 915 m in NW California, to 1220 m in New York and to 1920 m in Idaho; in Appalachians largely at higher elevation than *P. carolinensis* except on some of the higher summits



(e.g. Great Smoky Mts); in SE of range largely montane, breeding above 1200 m in North Carolina and Tennessee, and in Rocky Mts breeds at up to 2775 m in Colorado and at 2285–3200 m in New Mexico.

**Food and Feeding.** Food mostly small insects and larvae (principally caterpillars), also spiders (Araneae), small snails and slugs (Gastropoda), centipedes (Chilopoda). Also vegetable matter, including seeds, mostly of hemlock (*Tsuga*), also berries including blackberries (*Rubus*), blueberries (*Vaccinium*), honeysuckle (*Lonicera*), bayberry and mayberry (*Myrica*) and poison ivy (*Rhus radicans*); sap of sugar maple (*Acer saccharum*) also taken. Frequently visits birdtables, where takes variety of food items including animal fat and dead fish; most such items carried to secluded perch for swallowing. Stores food, mostly seeds and dead spiders, in caches in variety of locations, including crevices in tree trunks, behind loose bark, in bundles of dead leaves and pine needles, and in earth or snow; retrieves items from stores up to a month later. Often tame or confiding. Usually alone, in pairs, or in small groups of about twelve individuals (but up to 18 in areas where food easily available from birdtables); in autumn groups of juveniles gather for short periods; flocks have well-established social hierarchy, but low-ranking members of group may forage alone or join other flocks of same species, though usually returning to roost with original group. Also, winter groups often form basis for larger groups of mixed-species flocks. Actively forages at middle to low levels of trees and bushes, examining tree bark; hangs from branches and slender twigs, and gleans among foliage (apparently able to read clues to invertebrate presence, e.g. leaf damage by caterpillars); also occasionally hovers. In winter forages also in low branches and vegetation and on ground, including in areas some way N of breeding range. Occasionally pursues insects in flight.

**Breeding.** Season late Mar to early Jul; generally one brood. Monogamous, lifelong pair-bond; pair formation takes place throughout year, but predominantly in autumn and late winter to early spring. Courtship includes wing-shivering displays, calling softly, and feeding of female by male. Nest built by female, mostly of moss, bark strips, conifer needles, grass, plant fibres, wool, animal hair, gossamer and feathers, placed up to 7 m from ground in crevice or hole in tree, most frequently in hole or cavity in broken branch of decaying tree, occasionally in fence post, nest-hole excavated by both sexes; sometimes old hole of woodpecker (Picidae) utilized, or nestbox used in areas where natural sites scarce. Clutch 6–8 eggs; incubation by female, fed by male, period 11–14 days; chicks fed by both sexes, nestling period 12–16 days; young feed themselves within seven days of fledging, but remain with adults for further 21–28 days. Breeds in first year. Recorded longevity 12 years 5 months.

**Movements.** Largely resident, but descends from higher altitudes short distances to lower levels; also eruptive. In N of range, resident in areas of Alaska and Canada where mid-winter daylight limited to c. 3–5 hours and temperature may drop to –52°C. In years when seed crop poor or fails, large numbers (mostly juveniles) move S between mid-Sept and late Nov, usually to within 5 km of breeding range; movements usually during daytime and flocks often highly visible, especially along river valleys and at strategic points where they are reluctant to cross open water; largest recorded movement involved 36,000 individuals near Rochester, in New York, in Oct 1961. In breeding season has wandered N to Point Barrow (N Alaska), and in non-breeding season occurs irregularly S to Missouri, Oklahoma, Kentucky and Virginia; vagrant in Arizona.

**Status and Conservation.** Not globally threatened. Common to locally uncommon; generally widespread. Uncommon in NW (Alaska) and SW (Nevada and California). Population level fluctuates periodically, with peaks of cycle every 2–3 years. General increasing trend in numbers in E parts of range. Winter survival reliant on cached food supplies, especially in N populations; elsewhere, increased overwinter survival recorded when feeders and birdtables available.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Baker & Gammon (2007), Bent (1946), Bronson *et al.* (2005), David & Gosselin (2002a), Dixon (1961), Farrand (1985), Ficken (1981), Ficken *et al.* (1978), Giff, Mostrom & Mack (1993), Gill, Slikas & Sheldon (2005), Godfrey (1986), Haftorn *et al.* (1998), Harrap & Quinn (1996), Kaufman (1990), Martin & Norris (2007), McCarthy (2006), Mennill & Otter (2007), van Oort *et al.* (2007), Phillimore & MacDougall-Shackleton (2007), Pyle (1997), Ratcliffe *et al.* (2007), Sibley (2000), Smith *et al.* (1999), Sturman (1968a, 1968b), Yonick (2003).

## 6. Mountain Chickadee

### *Poecile gambeli*

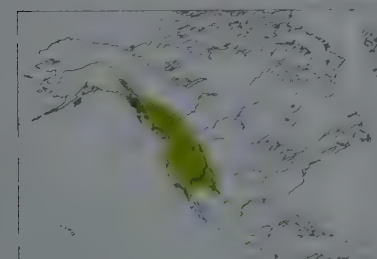
**French:** Mésange de Gambel **German:** Gambelmeise **Spanish:** Carbonero Montañés  
**Other common names:** Gambel's Chickadee

**Taxonomy.** *Parus gambeli* Ridgway, 1886, “about one day’s journey west of Santa Fé, New Mexico”, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has been placed in a superspecies with *P. sclateri*, sometimes including also *P. montanus*, *P. carolinensis* and *P. atricapillus*; has also been considered possibly conspecific with *P. superciliosus* or placed with it in a superspecies; further research required. Geographical variation largely clinal, and races intergrade; additional proposed races are *wasatchensis* (described from Wasatch Mts, in Utah), synonymized with *inoensis*, but sometimes included within nominate, and *grinnelli* (Idaho) and *abbreviatus* (California), both merged with *baileyae*. Birds in Davis Mts, in SW Texas, have been proposed as a further race on basis of small size. Four subspecies recognized.

#### **Subspecies and Distribution.**

- P. g. baileyae* (Grinnell, 1908) – Pacific slope of Rocky Mtns in W Canada and W USA.
- P. g. inoensis* (Grinnell, 1918) – W USA (SE Oregon and S Idaho S to CE California and NW Arizona).
- P. g. gambeli* (Ridgway, 1886) – WC USA (E Rockies from C Montana S to New Mexico and W Texas)
- P. g. atratus* (Grinnell & Swarth, 1926) – extreme NW Mexico (N Baja California).



**Descriptive notes.** 13–15 cm; 8–2–13.5 g. Medium-sized, black-capped chickadee with narrow white supercilium. Nominative race has forehead to crown and nape sooty black, upper lores/side of forehead and narrow supercilium (fading over ear-coverts) white, rest of lores and broad line through eye and across ear-coverts to nape side black; upperparts, including upperwing-coverts, grey-brown or tinged buffish, median coverts (broadly) and greater coverts (narrowly) edged pale grey; primary coverts finely fringed pale grey; flight-feathers grey-brown, finely fringed pale greyish-white on secondaries, whitest on in-

ner primaries and pale grey on longest tertials; tail grey-brown, outermost two feathers narrowly edged of flight-feathers and tail outer and abraded, underparts dusky and less whitish, iris dark reddish-brown to blackish; bill black or dark brownish-black; legs lead-grey, to blackish. Differs from *P. g. baileyae* in:

whiter underparts, from worn-plumage *P. atricapillus* in pale supercilium, longer bill, shorter tail.

Races differ rather little; *inoensis* is as nominate, but bill slightly longer and thinner, supercilium less distinct; *grinnelli* has slightly longer and thinner bill, *baileyae* has supercilium narrower and often shorter, upperparts darker.

Nominate, birds from Canada S to E Washington and Montana (“*grinnelli*”), smaller-billed, slightly darker grey with olive tinge above, and flanks buffish-tinged grey, birds from W Washington S to N California are smaller-billed, darker grey.

Most birds are sedentary, but some are nomadic, and some are migratory. In winter, they move to lower elevations and to more open areas.

“fee-bee”, or run into longer “fee-fee-fee, fee-bee-bee”, or plaintive “wee-chee-chee” or “dee-dee-dee”; occasionally a series of “fee-bee-bay” (similar to “three blind mice”) or “lee-chee-chee-chee”.

**Habitat.** Montane conifer forest and woodlands, including open and dense stands of hemlock (*Tsuga*), together with deciduous woodland, particularly American aspen (*Populus tremuloides*), oaks, willows (*Salix*) and cottonwoods (*Populus*); also more open areas of chaparral with scattered trees. In non-breeding season in similar habitat at lower levels, including shrubby areas of huckleberries (*Celtis*), and conifers in urban and suburban areas. Occurs at 1830–3350 m in Rocky Mts, above 730 m in NW California, at 2090–3660 m in New Mexico, and at 1500–3000 m in NW Mexico (Baja California); in non-breeding season also down to 900 m W of Rocky Mts and to 585 m in NW Mexico, but many still found in montane areas above 1525 m.

**Food and Feeding.** Food mainly small invertebrates, including adult and larval moths (Lepidoptera) and sawflies (Hymenoptera), bugs (Hemiptera), weevils and other beetles (Coleoptera), leafhoppers and scale insects (Homoptera) and spiders (Araneae). In breeding season, also aphids (Aphidoidea) (mostly in autumn); in autumn and winter takes conifer seeds, buds and berries. May visit birdtables for various items. Stores food, mostly seeds, throughout year, for use mainly during winter. Large seeds and prey items held in foot against perch and eaten in portions; hard-shelled seeds are often crushed in bill.

Individuals (usually paired birds), with established feeding hierarchies between males and pairs, may also join mixed-species foraging flocks. Actively forages in middle to lower levels of trees, including searching of trunks, gleaning by foliage of outer branches, hanging from slender branches and among twigs, in particular needle clusters; occasionally descends to ground.

**Breeding.** Season Apr–Jul; normally one brood, but in N California occasionally two. Pairs for

Nest built by both sexes, mostly of moss, grasses, bark strips, plant fibres, animal hair and feathers, in (Picidae) hole, or occasionally in ground in rodent hole under rocks, frequently in clearing in along woodland edge; nestboxes and holes in buildings and drainpipes also utilized; site often reused in subsequent years. Clutch 5–9 eggs, exceptionally 12; incubation by female, fed by male.

Recorded longevity 18 years.

**Movements.** Resident, but with some short-distance altitudinal movement. From early Sept some descend to foothills, valleys and adjacent plains (but many resident above 1525 m), returning from late Feb onwards; occasional late-summer ascent above breeding area to feed along tree-line. An uncommon winter visitor to coast of Washington and California (including S desert areas) and N Baja California, and in E of Oklahoma, Vagrant in Alaska, Saskatchewan, S Dakota and Nebraska.

**Status and Conservation.** Not globally threatened. Common in most of range; fairly common in E areas of range in Canada, but rare in Yukon.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Baker & Gammon (2007), Bent (1946), Bronson *et al.* (2005), David & Gosselin (2002a), Dixon (1961), Farrand (1985), Ficken (1981), Ficken *et al.* (1978), Giff, Mostrom & Mack (1993), Gill, Slikas & Sheldon (2005), Godfrey (1986), Haftorn *et al.* (1998), Harrap & Quinn (1996), Kaufman (1990), Martin & Norris (2007), McCarthy (2006), Mennill & Otter (2007), van Oort *et al.* (2007), Phillimore & MacDougall-Shackleton (2007), Pyle (1997), Ratcliffe *et al.* (2007), Sibley (2000), Smith *et al.* (1999), Sturman (1968a, 1968b), Yonick (2003).

in first year. Recorded longevity 18 years.

**Movements.** Resident, but with some short-distance altitudinal movement. From early Sept some descend to foothills, valleys and adjacent plains (but many resident above 1525 m), returning from late Feb onwards; occasional late-summer ascent above breeding area to feed along tree-line. An uncommon winter visitor to coast of Washington and California (including S desert areas) and N Baja California, and in E of Oklahoma, Vagrant in Alaska, Saskatchewan, S Dakota and Nebraska.

**Status and Conservation.** Not globally threatened. Common in most of range; fairly common in E areas of range in Canada, but rare in Yukon.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Baker & Gammon (2007), Bent (1946), Bronson *et al.* (2005), David & Gosselin (2002a), Dixon (1961), Farrand (1985), Ficken (1981), Ficken *et al.* (1978), Giff, Mostrom & Mack (1993), Gill, Slikas & Sheldon (2005), Godfrey (1986), Haftorn *et al.* (1998), Harrap & Quinn (1996), Kaufman (1990), Martin & Norris (2007), McCarthy (2006), Mennill & Otter (2007), van Oort *et al.* (2007), Phillimore & MacDougall-Shackleton (2007), Pyle (1997), Ratcliffe *et al.* (2007), Sibley (2000), Smith *et al.* (1999), Sturman (1968a, 1968b), Yonick (2003).

## 7. Mexican Chickadee

### *Poecile sclateri*

**French:** Mésange grise **German:** Graufänkchen **Spanish:** Carbonero Mexicano  
**Other common names:** Grey-sided Chickadee

**Taxonomy.** *Parus sclateri* (Grinnell, 1908), “about one day’s journey west of Santa Fé, New Mexico”, USA.

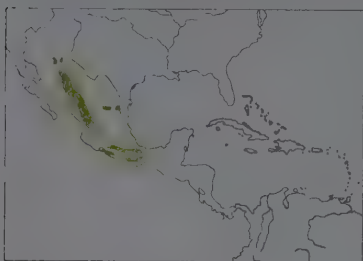
Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has been placed in a superspecies with *P. gambeli*, sometimes including also *P. montanus*, *P. carolinensis* and *P. atricapillus*; has also been considered possibly conspecific with *P. superciliosus* or placed with it in a superspecies; further research required. Geographical variation largely clinal, and races intergrade; additional proposed races are *wasatchensis* (described from Wasatch Mts, in Utah), synonymized with *inoensis*, but sometimes included within nominate, and *grinnelli* (Idaho) and *abbreviatus* (California), both merged with *baileyae*. Birds in Davis Mts, in SW Texas, have been proposed as a further race on basis of small size. Four subspecies recognized.

#### **Subspecies and Distribution.**

- P. s. baileyae* (Grinnell, 1908) – Pacific slope of Rocky Mtns in W Canada and W USA.
- P. s. inoensis* (Grinnell, 1918) – W USA (SE Oregon and S Idaho S to CE California and NW Arizona).
- P. s. gambeli* (Ridgway, 1886) – WC USA (E Rockies from C Montana S to New Mexico and W Texas)
- P. s. atratus* (Grinnell & Swarth, 1926) – extreme NW Mexico (N Baja California).



*P. s. garzai* (A. R. Phillips, 1986) – NE Mexico.  
*P. s. rayi* (A. H. Miller & Storer, 1950) – S Mexico.



**Descriptive notes.** 12.5–13.5 cm; 7.5–11 g. Medium-sized, black-capped chickadee with olive-grey upperparts. N nominate race has forehead to crown (including eye region) and nape black, crown often with glossy blue tips (in fresh plumage); nape feathers often raised to form crest when alarmed or agitated; upperparts olive-grey, paler or more heavily olive on rump and uppertail-coverts, greater upperwing-coverts with fine whitish tips, centres of median and greater coverts darker grey, fringed olive-grey, alula and primary coverts dark grey to blackish, the latter finely fringed olive-grey; flight-feathers blackish-grey, finely fringed

olive-grey on secondaries and on longest tertial, and paler on edges of primaries; tail dark grey, narrowly edged dull olive-grey; lores and cheek to side of nape white; chin and throat to centre of upper breast sooty black, forming large dark bib, sides and lower edge of which broadly tipped whitish (giving irregular lower edge); upper breast dull white or off-white, rest of underparts pale grey or smoke-grey, flanks washed slightly darker; in worn plumage, olive-grey edges of flight feathers duller and abraded, and bib more extensive and sharply defined; iris brown; bill black or greyish-black; legs dull bluish-grey. Sexes alike. Juvenile is as adult, but crown and bib slightly browner (lacking gloss), bib more extensively tipped pale grey at sides. Races differ only little: *eidos* is similar to nominate but slightly larger, upperparts and flanks slightly paler and greyer, lacking olive tinge; *garzai* has upperparts cold grey, and flanks light grey with light tinge of olive; *rayi* is as nominate, but upperparts and flanks more heavily tinged olive, rump tinged dull brown, and breast may be tinged yellowish. Voice. Calls include drawn-out, buzzy and insect-like “szree” or “szree-szree” or “sschleer”, sometimes in longer series of “szree-zee, szree-szreep, zeep” or interspersed with hissing notes as “tzee tzee tzee shhhh shhhh”; also a sharp “szip”, “tip”, “tsip” or “tseet” and thinner or higher-pitched “sip”, singly or repeated; also a harsh or hoarse and nasal “char”, “schaa” or “dzaa”, alarm a high-pitched “see-see-see” or more sibilant “zee-zee...” at approach of predator. Song, in autumn and early to middle spring, a series of short and loud unmusical phrases, “peeta peeta peeta” or “si-cha si-cha...”, frequently repeated.

**Habitat.** Open montane conifer forests and deciduous woodland. In Mexico breeds principally in oak (*Quercus*) with scattered pine (*Pinus*) or junipers (*Juniperus*) or pine-alder (*Pinus-Alnus*), and at higher altitudes in pine and fir (*Abies*) forests, with highest densities in pine-alder and fir forests; in S USA breeds in large open stands of ponderosa pine (*Pinus ponderosa*) and mixed stands of Engelmann spruce (*Picea engelmannii*) and Douglas firs (*Pseudotsuga menziesii*). Post-breeding dispersal also to other habitats, including oak-pine and Arizona cypress (*Cupressus glabra*). Breeds above 2000 m in S USA and between 1900 m and 3510 m in Mexico; in non-breeding season also lower, recorded down to c. 1500 m.

**Food and Feeding.** Details of diet not well known, presumably includes small invertebrates and larvae, also some seeds. Storing of food by captives documented, but caching not recorded in the wild. Usually in pairs or in small flocks of up to 13 individuals; often joins mixed-species foraging flocks totalling up to c. 100 individuals and containing several congeners, together with *Baeolophus wollweberi*, nuthatches (*Sitta*), kinglets (*Regulus*), Brown Creeper (*Certhia americana*), wrens (Troglodytidae) and vireos (Vireonidae). Forages in lower and middle levels of trees (frequently higher in non-breeding season) and shrubs, examining branches, twigs, slender foliage and open pine cones; hangs from leaves and twigs; occasionally hovers and pursues insects in flight. Rapidly hammers oak galls and acorns with blows from bill to open and remove parasitic insect larvae.

**Breeding.** Not well known. Season early Apr to mid-Jun; probably single-brooded. Monogamous. Courtship includes crouching and begging actions with quivering wings by female, accompanied by soft calls, and courtship-feeding of female by male. Nest built by female, material gathered by both sexes; made mostly of moss, plant fibres and animal hair, placed up to 18 m above ground in hole or cavity (possibly excavated by the pair itself) in dead tree or stump (usually pine or oak), or behind loose bark, or nestbox utilized; female recorded as adorning nest entrance with crushed beetles (Coleoptera), possibly using chemicals released by the insects as predator-deterrent. Clutch 5–9 eggs; incubation by female, fed by male; both sexes feed nestlings; no information on duration of incubation and fledging periods.

**Movements.** Resident, but some move altitudinally to lower levels from mid-Aug onwards; has wandered slightly N of breeding range in S USA.

**Status and Conservation.** Not globally threatened. Common to locally abundant in most of Mexican range, but uncommon in S Oaxaca; in USA, common in Arizona and uncommon in New Mexico. Total population in New Mexico estimated to be between 200 and 300 pairs. In Arizona (Chiricahua Mts), breeding densities of 1.7 pairs/10 ha in ponderosa pine, rising to 6.4 pairs in spruce-fir forest. Has declined in parts of C Mexico as a result of logging and increases in livestock grazing.

**Bibliography.** Anon. (1983b, 1998a), Bent (1946), Dixon (1961), Farrand (1985), Ficken (1990), Ficken & Nosedal (1992), Gill *et al.* (2005), Harrap & Quinn (1996), Howell & Webb (1995), Kaufman (1990), Pyle (1997), Sibley (2000), Sigler-Ficken *et al.* (1994).

## 8. White-browed Tit

### *Poecile superciliosus*

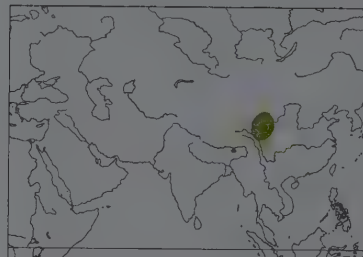
**French:** Mésange à sourcils blancs **German:** Weißbraunenmeise **Spanish:** Carbonero Cebijablanco

**Taxonomy.** *Poecile superciliosus* Przevalski, 1876, Gansu, north China.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has been considered conspecific with *P. gambeli* or placed with it in a superspecies; further research required. Monotypic.

**Distribution.** C & S China: E Qinghai E to S Gansu and N Sichuan, and NE & SE Xizang.

**Descriptive notes.** 13.5–14 cm; 10.1–12.4 g. Large, stocky, long-tailed tit with black cap and prominent white supercilium. Male has crown to nape dull black, long white supercilium from forehead (except narrowly in centre) rearwards, tapering on nape side; lores and broad eyestripe to over ear-coverts black; upperparts dark greyish-olive (variable, in SE Qinghai and NW Sichuan more brownish-grey), median and greater upperwing-coverts with dark grey-brown centres and broad greyish-olive fringes; flight-feathers blackish-brown, fringed pale greyish, secondaries with fine white tips, tertials fringed olive-grey; tail dark grey-brown, feathers narrowly edged paler grey and tipped whitish, outer web of outermost feather dull whitish; cheek to side of nape dull greyish-tinged cinnamon, moustachial region paler cinnamon; chin and throat sooty black, forming large dark bib, underparts pale pinkish to pinkish-cinnamon (in SE Qinghai and NW Sichuan often



see” usually in series, also thin “stip” or “tip” and dry, insect-like rattling “trrrrrr” or “tsirrrr” given in isolation or with other calls; alarm a series of “si”, “sip” or “tchip” notes with varying emphasis or run together in cadence, “tsi-sit-sit-sit-sit-sit-sip”, similar to calls of nuthatches (Sittidae). Song complex and fairly variable, usually includes variety of call notes or protracted notes, comprising a whistled “tsee-tsee-tsee”, ringing “pee” or “pwi-pee”, whistled “peta-peta-peta...”, loud clicking “tchip tchip” and prolonged rattling “tsirrrrr” in combinations, e.g. “tsee-tsee-tsee-pwi-pee, tchip-tchip-pwi-pee, tsirrrrr-pwi-pee, tsee-tsee-tsee-tsee tir ir ir ir ir ir ir ir ir ir...”, “peta-peta-peta”.

**Habitat.** Breeds in dwarf alpine rhododendron (*Rhododendron*), scrub and bushes, including willow (*Salix*), barberry (*Berberis*), buckthorn (*Rhamnus*) and honeysuckle (*Lonicera*), usually along watercourses between 3200 m and 4235 m. In non-breeding season frequents taller vegetation, including rhododendron and open edges of spruce (*Picea*) forest, and recorded also at lower altitudes in poplar (*Populus*) groves.

**Food and Feeding.** Diet little known, but includes small invertebrates and larvae, also some seeds. Occurs in pairs during breeding season, occasionally with additional individual present; in non-breeding season in small groups or parties of up to twelve individuals, when often in company with White-browed Tit-warbler (*Leptopoeile sophiae*). Forages low down in vegetation; fairly shy but typically active, and climbs to tops of taller plants before moving on to the next.

**Breeding.** Poorly known. Season at least May and Jun. Nest consists almost entirely of grass, placed in hole among roots of plants and rocks or in disused rodent burrow. No data on clutch size; eggs incubated by female, fed on and near nest by male. No other information.

**Movements.** Not well known. Considered to undertake short-distance altitudinal shifts; possibly longer movements in times of particularly severe weather, when recorded at lower levels in spruce forests and poplar groves.

**Status and Conservation.** Not globally threatened. Uncommon or locally common.

**Bibliography.** Cheng Tsohsin (1987), Eck (1980), Etchécopar & Hile (1983), Gill *et al.* (2005), Harrap & Quinn (1996), Hartert (1905), MacKinnon & Philipps (2000), Martens & Gebauer (1993), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Schäfer & Meyer de Schauensee (1938), Vaurie (1959).

## 9. Rusty-breasted Tit

### *Poecile davidi*

**French:** Mésange de David **German:** Davidmeise **Spanish:** Carbonero de David  
**Other common names:** Red-bellied/Pere David’s Tit

**Taxonomy.** *Poecile Davidi* Berezowski and Bianchi, 1891, southern Gansu, China.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has been considered conspecific with *P. lugubris*, but possibly more closely allied to *P. superciliosus*; further research required. Monotypic.

**Distribution.** C China: S Gansu S to S Sichuan, also S Shaanxi and W Hubei.



**Descriptive notes.** 12–13 cm; 10–12.5 g. Medium-sized, black-capped tit with fluffy white cheeks and cinnamon underparts. Has forehead to crown (down to bottom of eye) and nape black (often slightly glossy), side of neck rufous (forming half-collar); upperparts brown to brownish-olive, median and greater upperwing-coverts dark brown, broadly fringed brownish-olive, alula and primary coverts dark brown, finely fringed pale buff, flight-feathers brown, finely fringed pale buffish-brown (slightly paler on edges of outer primaries); tail brown to brownish-olive; cheek to nape side white, feathers loose or fluffy; chin and throat

sooty black, forming large dark bib, sides and lower edge of which rather indistinct; underparts cinnamon, slightly paler on centre of belly; in worn plumage, slightly paler brown on upperparts, and pale edges of flight-feathers usually abraded; iris dark brown or black; bill black or dark brownish-black; legs dull lead-grey to black. Sexes alike. Juvenile is as adult, but cheeks and ear-coverts washed yellowish or yellowish-buff, underparts paler or tinged yellowish, tail feathers have pointed tips. Voice. Calls include “sip” or “tsip”, “tis”, “psit” and harder “chit”, “sit” or “ssi”, also more drawn-out “chi-it-it” and a “tsip-tzee”; also “chic-a-dee”-type call given as song, “tsip-zee, tsip zee” or “tsip zee zee”.

**Habitat.** Mature mixed forest, usually including spruce (*Picea*), fir (*Abies*), pine (*Pinus*), birch (*Betula*), poplar (*Populus*), willow (*Salix*), alder (*Alnus*) and oak (*Quercus*), with shrub layer of bamboo, frequently in areas of red-barked birches. Occurs between 2135 m and 3400 m; similar habitat at slightly lower level in non-breeding season, e.g. recorded between 2200 m and 3050 m throughout winter in Sichuan.

**Food and Feeding.** Food not well known; presumably includes small invertebrates, larvae and seeds. Usually in pairs in breeding season, and in small groups of up to ten individuals in late summer and in non-breeding season. Agile, actively forages in upper and canopy levels of trees, also outer edges of middle levels and occasionally in shrubs; examines outer foliage and buds.

**Breeding.** Poorly known. Season at least May. Nest includes lichens and possibly moss, placed 4–10 m from ground in hole or cavity in decaying or rotting tree trunk or stump. Incubating female fed by male. No other information.

**Movements.** Resident; some short-distance movements to slightly lower levels in non-breeding season.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Central Sichuan Mountains EBA. Rare to locally not uncommon. Rather poorly known species. Relatively



small range and rapid rate of forest clearance within it give cause for concern over the long-term future of this parid.

**Bibliography.** Cheng Tsohsin (1987), Échécoar & Hûe (1983), Gill *et al.* (2005), Harrap & Quinn (1996), Hartert (1905), MacKinnon & Philipps (2000), Meyer de Schauensee (1984), Stepanyan & Loskot (1998), Vaurie (1959).

## 10. Siberian Tit

### *Poecile cinctus*

**French:** Mésange lapone **German:** Lapplandmeise **Spanish:** Carbonero Lapón  
**Other common names:** Alaskan Tit, Taiga/Grey/Grey-headed Chickadee (*lathamii*)

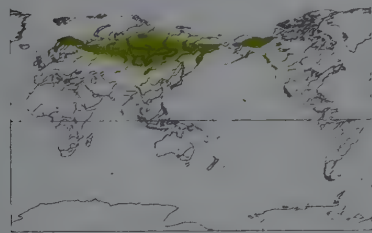
**Taxonomy.** *Parus cinctus* Boddaert, 1783, Siberia.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Forms a superspecies with *P. hudsonicus* and *P. rufescens*, and all have sometimes been treated as conspecific. Regularly hybridizes with *P. montanus*. Races intergrade, and boundaries between them poorly defined; ranges listed are provisional. Four subspecies recognized.

#### **Subspecies and Distribution.**

*P. c. lapponicus* (Lundahl, 1848) – Fennoscandia (except S) and N European Russia.  
*P. c. cinctus* (Boddaert, 1783) – NE European Russia and Siberia E to Bering Sea and Kamchatka, S to L Baikal and NC Mongolia.  
*P. c. sayanus* Sushkin, 1904 – S Siberia (Altai E to S Baikal area) and NW Mongolia.  
*P. c. lathamii* (Stephens, 1817) – NW USA (W & N Alaska) and NW Canada.

**Descriptive notes.** 13.5–14 cm; 11–14.3 g. Medium-sized, large-headed tit with loose fluffy plumage, grey to brown crown and brown upperparts, and black bib. Nominative race has forehead to crown and nape dark brownish or greyish-brown, lores and side of crown to over ear-coverts darker, blackish-brown; mantle, back and scapulars pale tan to light warm brown with very slight cinnamon tinge, uppertail-coverts the same or slightly buffish-brown; plumage somewhat variable, palest and greyest in N Russia (Taymyr Peninsula), brownest in NE Siberia and SE of L Baikal; lesser upwinging-coverts as scapulars,



median coverts broadly fringed brownish-grey, greater coverts with darker centres and fringed white; alula and primary coverts blackish, flight-feathers blackish-grey with pale or whitish-grey fringes (forming pale panel on closed wing), tertiaries as secondaries but slightly more broadly edged pale greyish; tail greyish-black, with broad pale buff edges of outer feathers; cheek and ear-coverts white, rear neck side off-white; chin and throat sooty brown, forming dark bib, with fine whitish tips on sides of throat and along lower border; underparts white or lightly washed buff, flanks brownish-buff, undertail-coverts pinkish-buff; in worn plumage, upperparts slightly paler or greyer, pale fringes of flight-feathers slightly whiter or abraded, bib slightly larger and better defined, and underparts whiter except for buffish flanks and undertail-coverts; iris dark brown; bill dark brown to black; legs bluish-grey to dark greyish-blue. Differs from *P. hudsonicus* in slightly larger size, greyer crown to back, whiter neck side, broader whitish edges on tertiaries and inner secondaries, and paler brownish-buff flanks. Sexes alike. Juvenile is similar to adult, but crown duller brown-black, upperparts duller grey-brown, cheeks and ear-coverts pale creamy white or tinged buff, bib larger and slightly paler brown and with white tips at sides, underparts whiter, buff wash on flanks and vent. Races differ little: *lapponicus* has tawny-brown upperparts with heavier cinnamon-brown tone, and fringes of greater coverts, secondaries and tertiaries narrower and less white; *sayanus* is very similar to nominate, but wing and bill slightly larger, crown greyer, and upperparts and flanks tinged more heavily rufous; *lathamii* is also similar to nominate, but upperparts and underparts on average slightly greyer, and flanks more extensively buff-brown (or tinged pinkish in fresh plumage). **Voice.** Contact calls include thin "tsit" or disyllabic "chit-sit", as well as nasal "tchay" or "dschee" and hoarse "psiup" (often as 3-note "psiup-psiup-psiup"); more frequently a "zi-zi tah tah", confusingly similar to that of *P. montanus*, and often given as part of longer series, "tsi-tsi ziew, tsi-tsi-zieuuw-ziew" or "sisiit-sisiit-see dza-dza-dza-dza-dza"; occasionally a harsher "char-char-char", also harsh "schaar" and high-pitched "ziew"; soft "see" note during display, and female on nest gives hissing anti-predator display similar to that of other tits. Song comprises short shrill notes, "shrii-shrii...", "tschi-tschi...", often included in mellow series of "chi-chi-chi-chi-diddle-wi" or more variable "prrrrrr-prrrrrrree" or rising "ptri-poi"; compared with other tits, song not loud or far-carrying.

**Habitat.** Lowland conifer forests, mostly of old-growth spruce (*Picea*) but also larch (*Larix*) and pine (*Pinus*, particularly *P. sibirica*), especially in areas with dead or decaying trees; in S & E Siberia also in submontane and montane birch (*Betula*) forests, riverine forest and adjacent birches and willow (*Salix*) thickets running through conifer forests; N of tree-line and tundra edge also occurs in dwarf and mature willows along rivers and creeks, and in montane areas on alpine heath. In non-breeding season, found in similar habitat as well as in alders (*Alnus*) and aspens (*Populus tremula*). Also found in dwarf scrub including Labrador tea (*Ledum palustre*).

**Food and Feeding.** Food small invertebrates, principally bugs (Hemiptera) including aphids (Aphidoidea), moths (Lepidoptera), flies (Diptera), caddis flies (Trichoptera), beetles (Coleoptera), spiders (Araneae) and snails (Gastropoda); also seeds, particularly of spruce, pine, juniper (*Juniperus*), larch, birch and rose (*Rosa*). Visits birdtables and refuse tips for scraps; recorded also as eating fat from frozen caribou (*Rangifer*) carcasses. Stores food throughout year in variety of caches, e.g. crevices behind loose bark, in lichen clusters and clumps of needles, and estimated that an individual stores up to 500,000 items (majority pine seeds) per year and exploits these during winter, when essential for survival (but in most years only 15% of stored food utilized); in experiments, food store apparently relocated by accident, instead of by memory; juveniles cache only c. 20% of the volume stored by adults in autumn, and this generally insufficient for winter survival (hence juveniles have greater dependence on winter movement and higher mortality rate). Usually in pairs or small parties, occasionally in mixed-species flocks or (especially juveniles) with parties of *P. montanus*; dominant over *P. montanus* in winter flocks and over *Parus major* at feeding sites. Actively and methodically forages in trees, searching branches, leaves and conifer needles; hangs from branches, and climbs thick branches in manner of a nuthatch (*Sitta*) before moving on to next. **Breeding.** Season May–Jul; usually one brood, but in C Russia (Altai Mts) sometimes two. Monogamous; pairs for life. Territorial; territory occupied throughout year, and may be shared by more than one pair. Display includes courtship-feeding of female by male, which continues to nestling stage. Nest, built by female, a platform of decaying wood, moss, grass stems and animal

hair or fur, placed up to 5 m from ground in hole in rotting tree trunk or stump, often old hole of woodpecker (Picidae); nestboxes used, particularly in areas where natural tree holes absent; territory size apparently large, c. 15–20 ha, or 50–100 ha in marginal or suboptimal habitats (but only small proportion used for breeding). Clutch 4–11 eggs; incubation by female, period 15–18 days; chicks fed by both parents, nestling period 19–20 days; young dependent on adults for up to further 13 days before being abandoned by parents, and then remain together for 3–4 days before dispersing. In N Finland, of 184 eggs, 74% hatched and 60% produced fledglings, average 4.78 young per nest; in second study, of 64 clutches, 72% successful, average 5.9 young per nest; average breeding success in C Finland 6.16 fledged young per breeding pair. Breeds in first year. Longevity at least 7 years; adult mortality at least 49% per year in Finland.

**Movements.** Adults sedentary, remain within territory throughout year. Juveniles, following dispersal from breeding area, are more nomadic (often forming flocks with *P. montanus*), moving between late Aug and Mar up to 200 km S into S Sweden and W & C Siberia; in exceptional years considerable numbers erupt during late Jun–Oct, and has reached S Urals, C Siberia (R Podkamennaya Tunguska) and middle R Amur and, in W, the Baltic coast (e.g. vagrant in Estonia), but, as other irruptive parids, is reluctant to cross large areas of open water. In North America, wanders widely along river valleys.

**Status and Conservation.** Not globally threatened. Common in Siberia, uncommon in Scandinavia and W Russia; rare in Alaska and NW Canada. Estimated European breeding population 164,000–294,000 breeding pairs. In Scandinavia occurs at densities of 0.2–7 pairs/km<sup>2</sup>; in heavily managed forests fewer than 0.5 pairs/km<sup>2</sup>, but density rises to 1.5 pairs where nestboxes available. Has declined in Norway and Finland, largely as a result of changes in forestry management (adversely affecting breeding and foraging areas) and possibly also climatic changes; range in Finland has retreated N by c. 200 km. In extreme N of range, survives severe winters only by complete dependence on food provided at human settlements.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Bent (1946), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Dixon (1961), Eek (1988), Échécoar & Hûe (1983), Farrand (1985), Flint *et al.* (1984), Gibb (1954, 1960), Gill *et al.* (2005), Godfrey (1986), Haftorn (1973), Hagemeijer & Blair (1997), Hailman & Haftorn (1995), Harrap & Quinn (1996), Harrison (1982), Hartert (1905), Hinde (1952), Johansen (1944), Kaufman (1990), McCarthy (2006), Orell *et al.* (1999), Pyle (1997), Rogacheva (1992), Sibley (2000), Svensson *et al.* (1999), Vaurie (1959), Virkkala (1990).

## 11. Boreal Chickadee

### *Poecile hudsonicus*

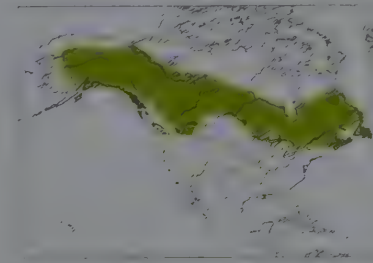
**French:** Mésange à tête brune **German:** Hudsonmeise **Spanish:** Carbonero Boreal  
**Other common names:** Hudsonian/Acadian/Brown-capped Chickadee

**Taxonomy.** *Parus hudsonicus* J. R. Forster, 1772, Severn River, Hudson Bay, Canada.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Forms a superspecies, and has been considered conspecific, with *P. cinctus* and *P. rufescens*. Geographical variation slight, and confused by seasonal and individual variation; additional named races, based on very slight differences, include *cascadensis* (Cascade Mts, in extreme S British Columbia and extreme N Washington, on SW Canada–USA border), merged with *columbianus*, and *rabbittsi* (described from Newfoundland, in E Canada), synonymized with nominate. Full review of fresh-plumaged individuals of all races required. Five subspecies currently recognized.

#### **Subspecies and Distribution.**

*P. h. stoneyi* (Ridgway, 1887) – NW USA (NC Alaska) and NW Canada.  
*P. h. columbianus* (Rhoads, 1893) – S Alaska and adjacent W Canada, S in NW USA to N Washington.  
*P. h. hudsonicus* (J. R. Forster, 1772) – C Alaska E to E Canada (E to Labrador and Newfoundland).  
*P. h. farleyi* (Godfrey, 1951) – SC Canada (F. British Columbia E to C Manitoba).  
*P. h. littoralis* (H. Bryant, 1865) – extreme SE Canada (S Quebec E to Prince Edward I and Nova Scotia) and extreme NE USA (E from New York).



**Descriptive notes.** 12.5–14.5 cm; 7–12.4 g. Medium-sized, brown-capped and black-bibbed tit with brown upperparts. Nominative race has forehead to crown (including side of crown to below eye) and centre of nape brown, neck side to centre of mantle grey, rest of mantle and upperparts greyish-olive, rump and uppertail-coverts warm buffish-brown; upwinging-coverts as back, lesser and median upwinging-coverts broadly fringed grey; flight-feathers and tail dark grey, finely edged pale grey; lores to eye and slightly over ear-coverts black, cheek white or whitish, becoming greyer on ear-coverts and side of neck; chin

and throat to centre of upper breast sooty black, forming dark bib (with fine whitish tips on sides of throat and along lower border); breast and centre of belly off-white, becoming greyish on side of breast and upper flanks, lower flanks bright cinnamon-brown, undertail-coverts duller or browner; in worn plumage, cheeks duller or dusky, pale fringes of flight-feathers abraded, bib slightly larger and better defined, and rufous on flanks paler or reduced in extent; iris brown; bill black, bluish-grey at base of lower mandible; legs bluish-grey to dark slate-blue. Differs from *P. cinctus* in slightly smaller size, browner crown to back, grey neck side, greyish edges of flight-feathers, and richer cinnamon-brown on flanks. Sexes alike. Juvenile is similar to adult, but crown duller and browner, upperparts also duller or browner, less olive, flight-feather edges dull brownish, bib slightly paler brown and less extensive (not reaching beyond lower throat), warm buff wash on flanks and vent. Races differ relatively little, mainly in size and coloration: *stoneyi* is slightly shorter-billed than nominate, has crown and rump tinged olive-brown, generally lacks pale grey on side of neck; *farleyi* is slightly larger than nominate, has upperparts slightly paler brown, side of neck a little paler grey; *littoralis* is slightly smaller and shorter-billed than nominate, has side of neck dull grey, upperparts somewhat warmer or more olive-brown, rump rufous-brown, flanks dull tawny; *columbianus* has slightly darker upperparts than nominate, some individuals have darker cap and/or darker slate-grey neck side, flanks light tawny-chestnut. **Voice.** Most frequent contact call "dee", "seep" or "up", often given in combination with other notes, e.g. "tsi-tsi-jaaay" or "tsi-tsi-jaaay-jaaay" or "pi-s zer zer, sisi-siu zer zer, chick-chick-char-char", also a harsh "zer-zer" and a sharp "chit" or "chik" as alarm. Song a repetition of the call notes and also sweet, musical, warbling phrases followed by sharp trill "ptwee-tit-tit-tit-tit", but generally silent during breeding season. **Habitat.** Dense lowland conifer forest, usually dominated by stands of spruce (*Picea*) and balsam fir (*Abies balsamea*); in N Alaska limit of range coincides with N limit of white spruce (*Picea*



*glauca*). Also in mixed woodlands including American aspen (*Populus tremuloides*), birches (*Betula*), alder (*Alnus*) and willow (*Salix*) thickets. Often close to bogs or muskeg. Sea-level to above 1525 m in British Columbia and up to 2070 m in Washington; in E of range, between 460 m and 1130 m in New York State.

**Food and Feeding.** Food small invertebrates, larvae and eggs, including moths (Lepidoptera), aphids (Aphidoidea), beetles (Coleoptera) and spiders (Araneae); also some fruit, principally berries of eastern red cedar (*Juniperus virginiana*), also conifer and birch seeds. Stores food mostly in late summer (Jul–Aug), in dead branches, under lichens, in needle clusters, and in deep crevices behind bark (above level of winter snow, but below level affected by blizzards); stored food recovered apparently by chance, rather than by memory. Holds large prey and seeds in foot (or feet), and tears them apart with hammer action of bill. Usually solitary or in pairs in breeding season, but from late summer often in small to medium-sized parties of up to 25 individuals; may join mixed-species flocks with kinglets (*Regulus*). Actively forages among foliage of upper levels of trees, usually in interior of tree, but also among outer foliage and cones at ends of branches; food items taken also from branches and trunk; feeds on the ground principally in spring, when melting snow reveals seeds. Also visits birdtables.

**Breeding.** Season late Apr to mid-Jul; one brood. Monogamous; probably pairs for life. Territorial; previous season's territory usually reoccupied in early spring, not advertised, but defended by singing male when interloper discovered. Courtship includes wing-quivering by female accompanied by begging calls, also feeding of female by male. Nest built solely by female, a pad of moss, lichens, plant fibres, bark strips, animal fur and feathers, placed up to 4–5 m from ground in upward-sloping hole excavated by the pair in tree trunk or stump, or in adapted natural hole or old hole of woodpecker (Picidae); nestboxes also utilized; territory size not well known. c. 5 ha. Clutch 4–7 eggs, occasionally 9; incubation by female, fed by male, period 11–16 days; chicks fed by both sexes, nestling period 15–18 days; young fly at 18 days, dependent on parents for up to a further 21 days. Breeds in first year. Recorded longevity 4 years 8 months.

**Movements.** Resident, and short-distance altitudinal migrant; also cyclically irruptive according to availability of conifer seed crop. Irruptions S, usually to within or just beyond S limits of range, occur between Oct and mid-Apr at intervals of 2–3 years, with larger-scale and longer-distance irruptions (commonly to well S of breeding range) every 6–8 years, often accompanied by similar movement of *P. atricapillus*. In irruptive years occurs S in USA to North Dakota, Wisconsin, Pennsylvania and New Jersey; vagrant S to Wyoming, Nebraska, Iowa, Ohio and Virginia.

**Status and Conservation.** Not globally threatened. Common or locally common; irregularly common in winter or in irruptive years. Densities of 2–11 pairs/km<sup>2</sup> in parts of Canadian breeding range; average of 4–5 pairs/km<sup>2</sup>, peaking with outbreaks of spruce-budworm. Appears to be able to withstand severe spells of extreme weather, e.g. –50°F.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Bent (1946), Dixon (1961), Farrand (1985), Ficken *et al.* (1996), Gill *et al.* (2005), Godfrey (1986), Harrap & Quinn (1996), Kaufman (1990), McCarthy (2006), Phillips (1986), Pyle (1997), Sibley (2000), Sorrie (1975).

## 12. Chestnut-backed Chickadee

### *Poecile rufescens*

**French:** Mésange à dos marron **German:** Rotrückenneise **Spanish:** Carbonero Dorsicastaño

**Taxonomy.** *Parus rufescens* J. K. Townsend, 1837, forests of Columbia River, probably near Fort Vancouver, Washington, USA.

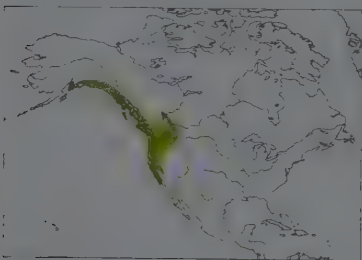
Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Forms a superspecies, and has been considered conspecific, with *P. cinctus* and *P. hudsonicus*. Nominata race and *neglectus* intergrade widely in area formerly occupied solely by the latter, which considered possibly now swamped by nominate; further research required. Three subspecies recognized.

#### Subspecies and Distribution.

*P. r. rufescens* (J. K. Townsend, 1837) – Alaska, SW Canada and W USA (S to coastal California).

*P. r. neglectus* (Ridgway, 1879) – coastal C California.

*P. r. barlowi* (Grinnell, 1900) – coast of SW California (S from San Francisco Bay).



**Descriptive notes.** 11.5–12.5 cm; 8.5–12.6 g. Small to medium-sized, black-capped and black-bibbed tit with chestnut upperparts. Nominata race has forehead and crown (including side of crown to below eye) and nape sooty brown, slightly darker or blacker on lores, around eye and over ear-coverts; upperparts, including lesser upperwing-coverts, bright chestnut, duller or olive-brown on uppertail-coverts; median upperwing-coverts dark grey, edged chestnut (as upperparts or slightly darker), greater coverts dark grey, fringed paler and tipped whitish; flight-feathers dark grey, tinged brown on tertiaries and secondaries, with

whitish-grey edges (broadest on lower tertial, narrow on inner primaries) forming pale panel on closed wing (usually absent when plumage worn); tail dark grey-brown, broadly fringed dull olive; lower lores, cheek and ear-coverts white to pale buffish-white, chin and throat to neck side and centre of upper breast black, remainder of breast to centre of belly white to dull buffish-grey, breast side and flanks chestnut, becoming duller or browner on vent; iris brown; bill black, with paler cutting edges, pinkish base of lower mandible; legs slate-blue to purplish-grey. Sexes alike. Juvenile is as adult, but crown and bib browner, cheeks duller (not white), and upperparts and flanks more cinnamon-brown, breast and belly greyer. Race *neglectus* is as nominate, but back paler chestnut, greater coverts edged whitish, upper two tertiaries finely fringed rufous, underparts paler grey, and rufous on flanks paler and more restricted; *barlowi* has dull whitish edges on greater coverts, all tertiaries fringed pale rufous, paler underparts, breast side and flanks to undertail pale greyish or tinged olive-brown, with amount of pinkish-buff or dull chestnut greatly reduced. Voice. Calls include frequently given "tsidi-tsidi-tsidi-cheer cheer" or "tsit ti jee jee" or variations, including "chlit-chlit-zee-zee" and "chis-li-zee chis-sli-sli zee zee"; also a deeper or slightly harsher "dee-dee-dee-dee", often given in aggression; other calls include high-pitched "seet", "tsit" or more metallic "tsi-lip" or "tsui-tip", as well as chirruping "chis-li", "chlit chit", "dzui" and "seezi", a musical "swi-swi-swi" or "siu-swee" which may be run into longer phrases, "sizi dzui sizi" or "sizi-dzee-dzee-dzee-dzee-si-dzee". Song appears to be a series of "chi" or "chip" notes on single pitch, "chip-chip-chi-chi-chi-chip", similar to that of Chipping Sparrow (*Spizella passerina*).

**Habitat.** Dense conifer forests, including firs (*Abies*, *Pseudotsuga*), cedars (*Thuja plicata*), hemlocks (*Tsuga heterophylla*), tamaracks (*Larix*) and redwoods (*Sequoia sempervirens*); also plantations,

including Monterey pine (*Pinus radiata*); pine-oak (*Pinus-Quercus*), alder (*Alnus*) and willow (*Salix*) thickets, and scrub; also ornamental trees, including eucalypts (*Eucalyptus*) and cypresses (*Cupressus*) in wooded suburban areas. Prefers woodland edges and borders of rivers or streams. Usually below 915 m, but in USA to up to 1700 m in NW California (Sierra Nevada) and to at least 1830 m in Idaho.

**Food and Feeding.** Food includes small invertebrates and larvae, particularly moths (Lepidoptera), aphids (Aphidoidea), scale insects (Coccoidea), leafhoppers (Cicadellidae), sawflies and wasps (Hymenoptera), spiders (Araneae), crickets (Orthoptera); in non-breeding season also fruits and seeds. Usually in pairs or in small flocks of up to 20 individuals, and occasionally in mixed-species flocks with *P. gambeli*, kinglets (*Regulus*), nuthatches (*Sitta*) and Brown Creepers (*Certhia americana*). Actively and acrobatically forages in foliage of canopy and upper levels of trees, by gleaning among leaves and hanging from slender twigs and branches; also in tangled undergrowth and shrub layer, but rarely descending to the ground. Occasionally pursues passing insects in flight.

**Breeding.** Season mid-Mar to end Jun. Monogamous, apparently pairs for life; one documented case of partners remaining together for four consecutive years. Territorial; occasionally loose colonies of up to seven pairs in close association. Nest built by female, mostly of green moss, animal hair or fur, plant fibres and feathers, placed up to 5 m from ground in cavity in dead branch, tree or stump, hole either excavated by pair or adapted from natural cavity or old hole of woodpecker (Picidae); occasionally in drainpipe, nestbox or disused Cliff Swallow (*Petrochelidon pyrrhonota*) nest; one site used for five years in succession. Clutch 6–8 eggs; incubation by female, period 12–14 days, exceptionally to 18 days; nestling period 18–21 days. Breeds in first year. Recorded longevity 6 years.

**Movements.** Largely resident; small numbers move altitudinally, including post-breeding dispersal to higher elevations in late summer and early autumn. Also, some wander between Nov and Mar, mostly within breeding range but also S to extreme S California; vagrant in Alberta (Canada).

**Status and Conservation.** Not globally threatened. In USA, common to locally common in S Alaska and S California, uncommon in Montana and Idaho; common in Canada. Some range expansion in 20th century in NW & SC California, largely as a result of increase in Douglas fir (*Pseudotsuga*) in mountain forests following cessation of logging and the maturing of orchards and shade trees in areas E of San Francisco; apparently still increasing in S of range.

**Bibliography.** Anon. (1983b, 1998a), Armstrong (1991), Burg (2007), Dahlsten *et al.* (2002), Dixon (1961), Farrand (1985), Gaines (1992), Gill *et al.* (2005), Godfrey (1986), Harrap & Quinn (1996), Kaufman (1990), McCarthy (2006), Pyle (1997), Sibley (2000), Sturman (1968a, 1968b).

## 13. Varied Tit

### *Poecile varius*

**French:** Mésange variée

**German:** Buntmeise

**Spanish:** Carbonero Variado

**Taxonomy.** *Parus varius* Temminck and Schlegel, 1848, Honshu, Japan.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Genus normally treated as feminine, but no evidence in original description or elsewhere justifies this, so genus is masculine by default. Has hybridized with *P. montanus*. Geographical variation largely clinal, grading progressively smaller and darker from N to S. Birds from Yakushima (off S Japan) described as race *yakushimensis*, supposedly slightly darker on forecrown and side of head than those on neighbouring Tanegashima, but differences considered insufficient to warrant separation from *sunsunpi*. Eight subspecies recognized.

#### Subspecies and Distribution.

*P. v. varius* (Temminck & Schlegel, 1848) – S Kuril Is, Japan, NE China (SE Liaoning, S Jilin) and Korea.

*P. v. sunsunpi* (Nagamichi Kuroda, 1919) – Osumi-shoto (Tanegashima, Yakushima), off S Japan.

*P. v. namiyei* (Nagamichi Kuroda, 1918) – N Izu Is (Toshima, Nijima, Kozushima).

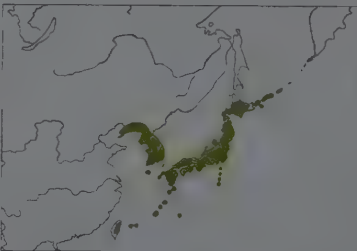
*P. v. owstoni* (Ijima, 1893) – S Izu Is.

*P. v. amamii* (Nagamichi Kuroda, 1922) – NC Ryukyu Is (Amami-oshima S to Okinawa).

*P. v. olivaceus* (Nagamichi Kuroda, 1923) – Iriomote, in S Ryukyus.

*P. v. castaneiventris* (Gould, 1863) – Taiwan.

*P. v. orii* (Nagamichi Kuroda, 1923) – Daito-jima (Borodino Is).



**Descriptive notes.** 12–14 cm; 15.9–18.2 g. Medium-sized, black-capped tit with grey upperparts and chestnut underparts. Male nominate race has forehead buffish, crown (including crown side down to eye) and nape black, slightly glossy on crown, sometimes a narrow yellowish-buff or whitish patch on hindneck; upper mantle chestnut (forming narrow band), rest of upperparts, including upperwing, deep greyish-blue, flight-feathers fringed narrowly paler grey; tail blackish, broadly fringed greyer; lores, cheek and ear-coverts pale buffish-white to off-white, usually slightly whiter on side of neck; chin and

throat to lower neck side black (sometimes flecked with rufous tips), centre of upper breast below bib whitish or light buff, belly and vent whitish-buff, flanks rufous-chestnut, undertail-coverts light cinnamon; iris very dark red to blackish-cinnamon; bill dark brown or black; legs dark grey. Female resembles male but slightly smaller on average, and paler or more buffish on breast side and flanks. Juvenile is a duller version of adult, crown to nape paler or greyer with extensive white tips, upperparts tinged grey-brown, greater coverts tipped pale buff to rufous-buff, tertiaries and secondaries fringed greyish-olive, lores, cheeks and ear-coverts buffish or yellowish, chin to breast smudged greyish, underparts mostly dull or dingy whitish, side of breast and flanks less extensively rufous than on adult, vent and undertail-coverts smudged with grey. Race *sunsunpi* is as nominate, but upperparts slightly darker grey, and breast side and flanks deeper chestnut; *amamii* differs from nominate in having slightly larger bill, chestnut on upper mantle reduced or absent, rest of mantle duller grey and washed olive, also duller chestnut on underparts; *olivaceus* is like previous, but slightly more heavily washed olive above; *castaneiventris* is similar to both of previous two and smaller than nominate, with chestnut on upper mantle restricted, lacks olive tinge on upperparts, and has entire underparts uniformly deep chestnut; *orii* has extensive area of chestnut on upper mantle, upperparts more clearly tinged olive, forecrown, head side and entire underparts deep chestnut; *owstoni* is similar to last but darker, has forehead to cheeks and neck side rufous, lower nape orange-rufous, upperparts greyish-tinged olive, underparts entirely cinnamon-rufous, darkest on breast and flanks; *namiyei* is intermediate between last race and nominate, cheek colour highly variable, from very pale buff to brick-brown. Voice. Calls include weak "tsuu tsuu tsuu" as contact, a thin, sharp "pit" or "chit", more drawn-out and high-pitched "spu-see-see-see" and scolding

“chi-chi-chi” or stuttering “stt-ti-ti-ti...”; also a variable “dza” to more prolonged “dzecu” in series as “dzer-dza-dza-dzer-dzer” notes, or in combination with “chit” or “stitz” as “stitz tit-dzer, stit-tit-dzer”, or may conclude with “dza-dza-dza”. Song, in Japan mostly between Mar and Jun, a repetition of monotone or variable whistles, usually including ringing “peee” as in “tsre-tsre peee-triri-peee-triri-peee-triri”; race *owstoni* recorded as giving “chip, tuwee, chip-chip-tuwee, chip-chip-tuwee”, but full range of geographical variation in song not fully studied; may also give faint but melodious subsong in Japan.

**Habitat.** Lowland conifer forests, particularly of yew (*Taxus*) in Kuril Is, and open deciduous and mixed forests in China and Taiwan; in Japan prefers mature deciduous, mixed and evergreen broadleaf forests, usually with dense undergrowth or shrub layer, also found in plantations mainly of cedar (*Cedrus*) and cypress (*Cupressus*, *Chamaecyparis*). Usually avoids urban areas or villages, but in Japan and Korea occurs in woodland areas around shrines (including in centre of Tokyo) and not infrequently in well-wooded large gardens. Principally in lowlands or hills, to c. 1100 m on Taiwan and in Korea; to c. 1600 m in S Japan, but generally below 1000 m in N Honshu. In S China, birds recorded in Guangdong were at c. 1200 m.

**Food and Feeding.** Food mostly small invertebrates, including spiders (Araneae); also seeds and nuts (principally of *Castanopsis cuspidata* and *Styrax japonica*) and berries, including those of yew. Food, principally nuts, stored in autumn and used to sustain birds through the following winter, also as food for young in following breeding season. Fairly shy and often elusive; usually solitary or in pairs, but in autumn and winter may form small parties or join mixed-species flocks. Forages mostly in upper and canopy levels, by gleaning prey from among foliage, and also from large branches and from tree trunks; not uncommonly feeds also at lower levels and in undergrowth. Occasionally pursues insects in flight.

**Breeding.** Season early Mar to Aug; possibly two broods in S of range. Pairs for life. Territory defended throughout year. Nest built mostly by female, mostly of moss and plant fibres, placed up

to 6 m from ground in natural hole or cavity in tree or old stump, or pair may excavate hole or utilize old hole of woodpecker (Picidae); also uses (but less frequently prefers) nestboxes, and cavities under eaves of buildings. Clutch 6–7 eggs on Japanese mainland, slightly fewer (on average, 4–6) on S islands; incubation by female, period 12–14 days; nestling period 17–21 days; young dependent on parents for further 21 days, thereafter semi-independent but may be fed by parents for up to 80 days further. Breeding success in nestboxes on Kozushima, in N Izu Is (race *namiyei*), very poor: of 51 nests monitored, 83% failed to produce any young, main cause of failure being predation by snakes.

**Movements.** Largely resident. Some may move altitudinally or make local and relatively short movements in Japan (principally Hokkaido) and Korea, where small numbers on passage in late Apr and May and Oct–Nov, but present throughout year in N of range. Apparently only vagrant on Sakhalin I, where two birds recorded in 1976, though it could perhaps be a sporadic breeder.

**Status and Conservation.** Not globally threatened. Common or locally very common to abundant in S Japan and Kuril Is; uncommon in N Japan (Hokkaido and N Honshu), local on Taiwan, and rare in NE China. In Daito-jima (race *orii*) now presumed extinct, as not found in surveys in 1984 and 1986 or subsequently. In Japan, densities in evergreen forest 1–3 pairs/km<sup>2</sup> to 5–6 pairs/km<sup>2</sup> in S Honshu, and 10–15 pairs/km<sup>2</sup> in Izu Is. Introduced and apparently established in Hawaii Is (on Kauai and Oahu), but not seen since 1963. In SE China, individuals of unknown race recorded on Ba Bao Shan (S Guangdong), but proximity to Hong Kong suggests possibility of escapes from captivity. This species is one of the three most popular cagebirds in Japan, and traditionally taken for use in fortune-telling; effects of cagebird trade on wild populations not known.

**Bibliography.** Brazil (1991), Cheng Tsohsin (1987), Chikara (2002), Dementiev *et al.* (1954, 1970), Étiénnecopar & Hôe (1983), Flint *et al.* (1984), Gill *et al.* (2005), Harrap & Quinn (1996), Hartert (1905, 1921, 1923), Lee Woo-Shin *et al.* (2000), MacKinnon & Philipps (2000), McCarthy (2006), Meyer de Schauensee (1984), Pratt *et al.* (1987), Tomek (2002), Vaurie (1959).



14



*ssp rubidiventris*

15



*ssp beavani*



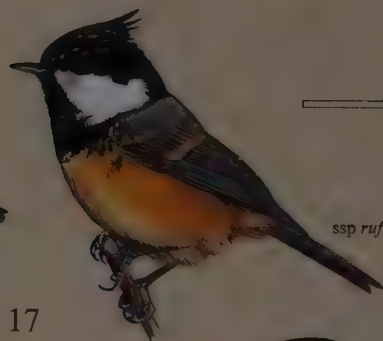
16



*ssp ater*



17



*ssp rufipectus*

PLATE 53

inches

3

cm

8

*ssp ledouci*



*ssp gaddi*



*ssp cypristes*



18



*ssp elegans*

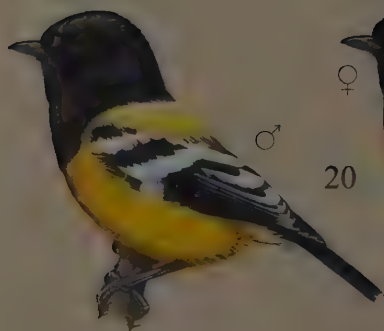


*ssp mindanensis*

♀

20

♂



♀

19



♀



21



*ssp cristatus*

*ssp abadii*



22



*ssp dichrous*

*ssp dichroidea*



Genus *PERIPARUS* Selys-Longchamps, 1884

14. Black-breasted Tit

*Periparus rufonuchalis*

**French:** Mésange à nuque rousse    **German:** Fichtenmeise    **Spanish:** Carbonero Nuquirrofo  
**Other common names:** Rufous-naped/Rufous-vented/Black-crested/Dark Grey/Simla Black Tit

**Taxonomy.** *Parus rufonuchalis* Blyth, 1849, Simla, north-western Himalayas, India. Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Occasionally considered conspecific with *P. rubidiventris*. Birds from Afghanistan E to N Pakistan (Gilgit) have been proposed as warranting racial separation (as *blanchardi*), but differences from populations elsewhere appear inconstant. Monotypic.  
**Distribution.** S Uzbekistan, Tajikistan and Kyrgyzstan, SW China (W Xinjiang), NW & E Afghanistan, W & N Pakistan and E in Himalayas to WC Nepal (Kali Gandaki gorge).



**Descriptive notes.** 13 cm; 11.4–14.7 g. Medium-sized to large, dark tit with short peaked crest and bright white cheeks. Male has forehead to crown and crest black or slightly glossy blue-black, small whitish nuchal patch with lower edge buff or warm buff-brown (purer white in N Pakistan); cheek and ear-coverts white; upperparts dark grey, tinged lightly olive (mantle paler grey in E Afghanistan and N Pakistan); tail similar to upperparts, all rectrices finely fringed paler or bluish-grey; upperwing-coverts dark grey, fringed bluish-grey; flight-feathers blackish-grey, finely fringed bluish-grey; chin and throat (including side of throat) to breast and upper belly black, side of lower breast, upper flanks and axillaries rufous or light cinnamon (often visible at bend of wing), lower belly and lower flanks grey, undertail-coverts light rufous to cinnamon (paler and more buff in N Pakistan); iris brown; bill black; legs lead-grey to black. Differs from *P. rubidiventris* in larger size, more extensive black bib (reaching to upper belly) and grey (not rufous) lower belly; from *P. melanolophus* also in having uniform wings. Female is very like male, but on average has less gloss on crown and duller, less extensive black on breast and upper belly. Juvenile is similar to adult, but crown and crest duller or dark grey, crest also shorter, nape patch dull whitish, upperparts more clearly washed brownish-olive (but tail and wings as adult), cheeks washed faintly buffish, chin to breast smudged blackish, rest of underparts dull grey-brown, paler buff on undertail-coverts. Voice. Calls include plaintive “cheep” or “peep” and short “sip”, often in combination as e.g. “sip-sip-sip, pee-sip, sih-pee, puu-sih-pu, tu-si-si”, also low-pitched, sharp “chut” or “chut-chut” and rapid “trrrr” similar to that given by *Parus major*. Has two songs: one (for establishing and marking territory) a series of up to 6 whistled notes followed by rapid trill or buzz, “tip tip-pee-trrrrrrr”, sometimes with other whistles added at end; the other song (in territory defence) a variable series of whistled notes followed by downslurred whistle, “tsi-tsi-peeduw”, or “whi-when, pitch-uu” reminiscent of some songs of *P. ater*, or a loud and slightly slower “tju-tju-hee”.

**Habitat.** Montane and submontane conifer forests, principally of spruce (*Picea*), fir (*Abies*), deodar (*Cedrus deodara*) and pine (*Pinus*). In W of range (E to NW Himalayas) most frequently found in junipers (*Juniperus*), and in C Himalayas extends into spruce-oak (*Picea-Quercus*), birch (*Betula*) and rhododendrons (*Rhododendron*); occurs also in more open areas of scattered scrub and trees on hillsides. In NW Pakistan also in poplars (*Populus*), willows (*Salix*) and edges of cultivation, particularly mulberries (*Morus*) and in hazel (*Corylus*) scrub. Breeds at 1800–3000 m in C Asia and Afghanistan, 2200–3700 m in N Pakistan and N India, 2400–4000 m in W Nepal, and 2900–3500 m in NW China; in non-breeding season also at lower levels, down to 1200–1500 m in C Asia, down to 2100 m but exceptionally to foothills at c. 760 m in N Pakistan, and down to 1500 m elsewhere in Himalayas.

**Food and Feeding.** Food mostly small invertebrates, seeds and berries; nestlings fed entirely with insects and larvae. Uses cracks in bark or branches as regular ‘anvils’ in which it places seeds and nuts, opening these by hammering them rapidly with the bill; not known to store food. Usually solitary, in pairs in breeding season; may join small mixed-species foraging flocks, often including *P. melanolophus*. Forages at all levels, from tops of trees to undergrowth, and frequently on ground.

**Breeding.** Season Apr–Jul. Monogamous. Display by male includes drooping and quivering of half-opened wings, hopping around female while emitting soft twittering notes. Nest built by both sexes, mostly of moss, animal hair or fur, wool and feathers, male adding material while female incubating, placed deep within hole or cavity low down (less than 1 m from ground) in tree trunk or stump, or in hole in wall, or frequently on ground in hole in steep bank, under stones or among roots of tree. Clutch 4–6 eggs; incubation by female, chicks fed by both parents; no information on duration of incubation and nestling periods.

**Movements.** Largely resident; appears very well adapted to extremely cold winters at high elevations, but small numbers descend to lower levels outside breeding season.

**Status and Conservation.** Not globally threatened. Common in N India, and fairly common in Nepal; elsewhere in range locally common, but uncommon in W China.

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Dementiev *et al.* (1954, 1970), Échécopar & Hûe (1970, 1983), Fleming *et al.* (1979), Flint *et al.* (1984), Gill *et al.* (2005), Grimmer *et al.* (1998), Harrap & Quinn (1996), Hartert (1905), Hûe & Échécopar (1970), Inskipp & Inskipp (1991), Jamdar & Price (1990), King *et al.* (1975), MacKinnon & Philipps (2000), Martens (1971), Martens *et al.* (2006), Rasmussen & Anderton (2005), Roberts (1992), Stuart Baker (1932), Vaurie (1959).

15. Rufous-vented Tit

*Periparus rubidiventris*

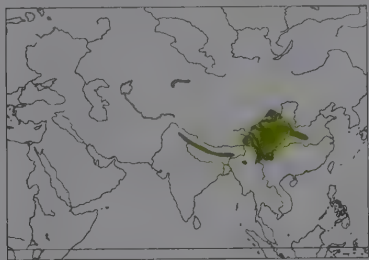
**French:** Mésange cul-roux    **German:** Rotbrustmeise    **Spanish:** Carbonero Culirrofo  
**Other common names:** Rufous-bellied Crested Tit, Black Crested Tit; Sikkim Black Tit (*beavani*)

**Taxonomy.** *Parus rubidiventris* Blyth, 1847, Nepal.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Occasionally treated as conspecific with *P. rufonuchalis*. Race *beavani* not known to interbreed with nominate and has been considered to represent a separate species; further research required. Marginally paler birds with different wing proportions from NC China (NE Qinghai) are genetically different and probably better separated as race *whistleri*; those of W Sichuan similar to previous but possibly further separable as slightly darker race *szetschwanensis*. Three subspecies provisionally recognized.

**Subspecies and Distribution.**

*P. r. rubidiventris* (Blyth, 1847) – W & C Himalayas from Kashmir E to C Nepal.  
*P. r. beavani* (Jerdon, 1863) – E Himalayas, C & SW China (Qinghai E to S Shaanxi, S to S Xizang, W Yunnan and N & W Sichuan) and NE Myanmar.  
*P. r. saramatii* (Ripley, 1961) – NE India (Nagaland) and adjacent NW Myanmar (Mt Saramati).



**Descriptive notes.** 12–13 cm. 7–13.1 g. Small to medium-sized, compact tit with black cap and pointed crest, rufous underparts. Male nominate race has forehead to crown and crest black or slightly glossed bluish, small nuchal patch white with faint rufous tinge; cheek and ear-coverts whitish; upperparts dark grey, lightly tinged olive, except for more buffish uppertail-coverts; tail similar to back, all rectrices finely fringed bluish-grey; upperwing-coverts dark grey, fringed bluish-grey; flight-feathers blackish-grey, finely fringed bluish-grey, palest on inner primaries; chin and throat (including side of throat) to upper breast

black, rest of underparts light rufous (deeper on belly) or rufous-buff, except for greyish lower breast side and flanks; in worn plumage, crown duller, upperparts darker and underparts duller; iris blackish-brown to reddish-brown; bill black; legs lead-blue to blue-grey. Differs from *P. rufonuchalis* mainly in smaller size, less extensive black on breast, and rufous belly to undertail-coverts; from *P. melanolophus* in having darker coloration, rufous underparts, no white tips on wing-coverts. Female is very like male, but on average slightly paler on crown and duller on chin to upper breast. Juvenile is similar to adult, but crown and blunt-tipped crest duller, nape patch dull whitish, upperparts washed buffish, cheeks washed buffish-yellow, chin to breast smudged dull brownish-black and contrasting very little with rest of dull grey underparts, undertail-coverts dull buff. Racial variation well marked: *beavani* has nuchal spot off-white or buffish, cheeks washed buffish, upperparts more heavily tinged bluish-grey (not olive), grey lower breast becoming greyish-buff on belly and flanks, undertail-coverts deep cinnamon, juvenile darker above than nominate and with yellowish cheeks and ear-coverts, adults in N of range (NE Qinghai) slightly paler on mantle and uppertail-coverts and paler rufous on belly; *saramatii* has upperparts washed buffish-olive, richest buff on rump, underparts dull olive-grey. Voice. Calls include thin high-pitched “seet” or “seep” and clearer or more silant “pseet”, “pee” or “piu” and “psit”, together with softer “pwit” or “whit”, also sharp “chip”, “chit” or “tip”, all of which may be given in longer combined series, e.g. “seep-seep, seep-seep sip-ti, pseet-seep, tip-pee, tip-piu-sweep, tip-piu-chip”, or may vary combinations with stuttering “ch-ch-ch-ch” series or longer variation of “chip-sweep” notes; alarm includes scolding “chit-it-it-it...” and rapid “tsit-tsit-tsit-tsit, tsweep”, also “whid-ip” or “whid-id-ip”. Song mid-Mar to mid-Jun, varies geographically, in W of range (nominate race) a rattling series of up to 30 “chi-chi-chi” or “chip-chip-chip-chip” or “sfrit-chut-chut” notes, with rapid delivery of up to 10 notes per second; in E combines the rattle with whistled notes at varying pitches, either pure or downslurred, e.g. “tu-toodle-toodle-toodle-toodle-ut” and ringing “seet-cha-weet”, also slower, musical trilling “schip-it, schip-it, schip-it”, repeated frequently.

**Habitat.** Forests, mostly deciduous, principally oak (*Quercus*), and mixed broadleaf forest and woodland, to mixed forests of pine (*Pinus*), hemlock (*Tsuga*), cypresses (*Cupressus*, *Chamaecyparis*), rhododendron (*Rhododendron*), birch (*Betula*), fir (*Abies*), juniper (*Juniperus*) and dwarf willow (*Salix*); breeds in rhododendron forest in NE India (Nagaland). Also visits high-altitude rhododendron and treeless scrub. Breeds at 3000–4100 m in W Himalayas, 2550–4250 m (possibly regularly to 4575 m) in Nepal, 2745–4270 m in E Himalayas, from 2500 m to tree-line in China, and at 2745–3660 m in N Myanmar. In non-breeding season, also temperate oak forests at lower elevations, down to c. 2400 m in W Himalayas, to c. 2100 m in Nepal and slightly higher in E Himalayas, at 2800–3200 m in Bhutan, but many remain at high levels throughout winter, e.g. recorded at 4270 m in Feb in Nepal and at 2440–3050 in NE Qinghai (China).

**Food and Feeding.** Diet poorly known; presumably includes small invertebrates and larvae, and some seeds. Usually in pairs or in groups of up to 20, including during breeding season; also in mixed-species foraging flocks (but rarely associates with other parids) in non-breeding season. Forages mostly in canopy and upper levels of forest trees, but also descends to lower levels and undergrowth.

**Breeding.** Poorly known. Season Apr–Jun in Himalayas. Nest mostly of moss and animal fur, placed up to 6 m from ground in hole or cavity in tree, or in hole in ground in bank or among roots of tree. Clutch 2–3 eggs. No further information.

**Movements.** Resident, with some altitudinal movements to lower levels in non-breeding season.

**Status and Conservation.** Not globally threatened. Generally common in Himalayas and in SW China (SE Xizang), although less numerous to uncommon in W Himalayas; common in C China and locally common in N Myanmar. Situation in Kashmir and NW India unclear, but species is apparently a very scarce breeder there.

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Échécopar & Hûe (1983), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmer *et al.* (1998), Harrap & Quinn (1996), Hartert (1905), Hûe & Échécopar (1970), Inskipp & Inskipp (1991), Jamdar & Price (1990), King *et al.* (1975), MacKinnon & Philipps (2000), Martens & Eck (1995), Martens *et al.* (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Spierenburg (2005), Stuart Baker (1932), Vaurie (1959), Wolters (1980a).

16. Spot-winged Tit

*Periparus melanolophus*

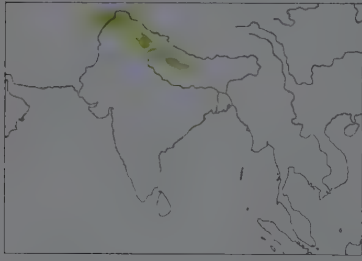
**French:** Mésange de Vigors    **German:** Schwarzschoepfmeise    **Spanish:** Carbonero Crestinegro  
**Other common names:** Crested Black Tit, Black-crested Tit, Spot-winged Black Tit, Vigors’s Tit

**Taxonomy.** *Parus melanolophus* Vigors, 1831, Simla–Almora district, Himalayas, north India.



Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *P. ater*, and the two regularly hybridize in W Nepal; sometimes considered conspecific. Birds from NE Afghanistan and adjacent Pakistan, slightly larger and with darker upperparts than those elsewhere in species' range, may merit subspecific recognition; further research required. Monotypic.

**Distribution.** E Afghanistan, NW Pakistan and Himalayas E to WC Nepal.



**Descriptive notes.** 11–12 cm; 7–9.8 g. Small to medium-sized slaty-grey tit with pointed black crest. Has forehead to crown (including crown side down to eye) and crest, nape and upper mantle black or glossy blue-black, white nuchal patch; cheek and ear-coverts pure white; lower mantle and rest of upperparts bluish-grey with light olive tinge (darker grey at W end of range); tail dark brownish-grey, all feathers finely fringed paler or bluish-grey; upperside-coverts blackish-grey, broadly fringed bluish-grey, tips of median and greater coverts whitish with rusty-buff outer edge, alula and primary coverts blackish, in fresh plumage finely

fringed blue-grey; flight-feathers dark brown to blackish, narrowly fringed bluish-grey, secondaries and primaries sometimes finely tipped white; chin and throat (including side of throat) to upper breast black, upper flanks bright rufous to cinnamon (may extend narrowly to lower flanks), lower breast, belly, lower flanks and vent grey (individuals with cinnamon-orange on belly and vent considered hybrids), undertail-coverts light rufous or cinnamon-buff; axillaries light cinnamon (often restricted to bend of wing); in worn plumage, crest slightly shorter or blunt-tipped, crown less glossy, upperparts less bluish, pale tips of wing-coverts abraded and whiter, edges of flight-feathers worn or abraded, bib duller or browner, underparts also duller; iris brown; bill black; legs lead-grey to dark bluish-grey. Differs from both *P. rufonuchalis* and *P. rubridiventris* in smaller size, broad white wingbars on tips of wing-coverts and smaller bill, from former also in having less black on breast and from latter in having grey (not rufous) belly; differs from *P. ater* mainly in darker mantle, rufous on breast side and flanks, dark grey belly. Sexes alike. Juvenile is similar to adult, but crown and crest duller, crest also shorter, nape patch dull whitish or fringed brownish, upperparts (including upper mantle) more clearly washed olive-brown, tips of median and greater upperside-coverts often more extensively rusty buff and forming complete wingbars, inner tertials tipped buffish, cheeks washed faintly buffish, chin to breast dark brown, sometimes greyer on lower throat and breast, and duller grey on rest of underparts except for paler buff undertail-coverts. **VOICE.** Calls frequently; many calls closely similar to those of *P. ater*, include thin "tsit" or "stii", occasionally as more emphatic "psip" or "pip" or more explosive "chziou" or "piu", often combined in longer series of "pip-chziou, pip, pip-sziu..." or "pet-chew, pet-chew", together with lower-pitched, plaintive 3-note "tsi-tsu-whichoo, tsi-tsu-whichoo", and high-pitched or squeaky "si" which may be run into longer "sisisi"; has been recorded as giving snake-like hiss when defending nest. Song a repetition of "psip-iu..." and "chip-wi", similar to that of *P. ater*.

**Habitat.** Breeds in montane and submontane conifer forests, including pine (*Pinus*), deodar (*Cedrus deodara*), fir (*Abies*), spruce (*Picea*) and juniper (*Juniperus*), usually with shrub layer of rhododendron (*Rhododendron*); at 1500–3000 m in Afghanistan, 1800–3200 (perhaps to 3660 m) in N Pakistan, 1525–3355 m (locally to 3700 m) in NW & N India, and 2800–4000 m in Nepal. In non-breeding season also in oak (*Quercus*), willows (*Salix*) and hazel (*Corylus*) groves in open scrubby areas with scattered conifers; in Pakistan recorded in foothills down to 600 m, exceptionally to 370 m or lower, including in gardens in large cities (Islamabad, Rawalpindi) and plains of R Indus in Feb; many, however, remain at high altitude throughout winter, including at 2400 m in N Pakistan and at 2955 m in Kashmir when deep snow still lying.

**Food and Feeding.** Food consumed is not well known, but includes small invertebrates, larvae, seeds, and berries and other fruit; takes sunflower (*Helianthus*) seeds from gardens. Usually in pairs or in varying sized groups throughout year; in autumn up to 80 together, and during winter flocks of 50 (30–40 still together in Apr); also joins mixed-species foraging flocks containing other parids, small warblers (Sylviidae), Goldcrests (*Regulus regulus*), Eurasian Treecreepers (*Certhia familiaris*) and other insectivores. Actively and restlessly forages in lower to middle levels of conifers, searching through foliage, examining twigs and cones and hovering on outer edges, in spring also in canopy of deciduous trees. At all times may forage at lower levels in shrub layer or on ground.

**Breeding.** Season Apr to early Jul; one brood. Monogamous. Nest consists of moss, animal fur, wool and/or hair, placed up to 3 m (exceptionally to 15 m) from ground in natural hole or cavity in tree trunk or stump, less frequently in hole in wall (including of inhabited house) or bank. Clutch 5–6 eggs, exceptionally 10; incubation by female, fed on nest by male, period 14–15 days; chicks fed by both parents, nestling period up to 21 days.

**Movements.** Resident, or makes short-distance post-breeding descent to lower levels.

**Status and Conservation.** Not globally threatened. Common to abundant; the commonest tit throughout most of W Himalayas E to W Nepal.

**Bibliography.** Ali & Ripley (1983), Bates & Lowther (1952), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmett *et al.* (1998), Harrap & Quinn (1996), Hartert (1905), Hüb & Échécopar (1970), Inskipp & Inskipp (1991), Martens & Eck (1995), Martens *et al.* (2006), McCarthy (2006), Paynter (1962), Rasmussen & Anderton (2005), Roberts (1992), Stuart Baker (1932), Vaurie (1959).

## 17. Coal Tit

### *Periparus ater*

**French:** Mésange noire

**German:** Tannenmeise

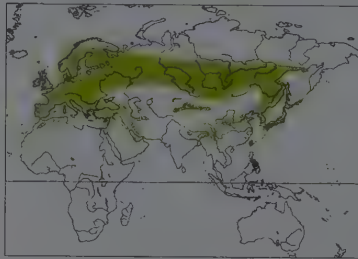
**Spanish:** Carbonero Garrapinos

**Taxonomy.** *Parus ater* Linnaeus, 1758, Sweden.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *P. melanolophus*, and the two regularly hybridize in W Nepal; sometimes considered conspecific. Known to have hybridized also with *Poecile montanus*, *Lophophanes cristatus* and *Parus major*. Geographical variation well marked but complicated by high degree of local and individual variation within populations; furthermore, races intergrade in parts of range; ongoing genetic research suggests presence of a series of regional clusters across range. Additional proposed races are *pinicolus* (described from Scotland), synonymized with *britannicus*; and *abietum* (from W & C mainland Europe), *rossosibiricus* (C Russia from Moscow E to about L Baikal) and *amurensis* (Amurland, Ussuriland, Sakhalin), all merged with nominate. Recently described *ekodendricatus* (Gansu, Sichuan, Shaanxi, N Yunnan) morphologically almost identical to *aemodius*; probably merits separation, on basis of genetic differences. Twenty-one subspecies currently recognized.

#### Subspecies and Distribution.

- P. a. britannicus* (Sharpe & Dresser, 1871) – Great Britain and extreme NE Ireland.  
*P. a. hibernicus* (Ogilvie-Grant, 1910) – Ireland.  
*P. a. ater* (Linnaeus, 1758) – N, C & E Europe, W & S Asia Minor, N Syria and Lebanon, and Siberia E to Sakhalin, and S to Altai, N Mongolia, NE China (Manchuria E to E Liaoning) and Korea.  
*P. a. vieirae* (Nicholson, 1906) – Iberian Peninsula.  
*P. a. sardus* (O. Kleinschmidt, 1903) – Corsica and Sardinia.  
*P. a. atlas* (Meade-Waldo, 1901) – Morocco.  
*P. a. ledouci* (Malherbe, 1845) – N Algeria and NW Tunisia.  
*P. a. moltchanovi* (Menzies, 1903) – S Crimea.  
*P. a. cypristes* (Dresser, 1888) – Cyprus.  
*P. a. derjugini* Zarudny & Loudon, 1903 – SW Caucasus S to NE Turkey.  
*P. a. kichalowskii* (Bogdanov, 1879) – Caucasus (except SW) and C & E Transcaucasia.  
*P. a. gaddi* Zarudny, 1911 – SE Azerbaijan and N Iran.  
*P. a. chorassanicus* (Zarudny & Bilkevitch, 1911) – SW Turkmenia and NE Iran.  
*P. a. phaenotus* (Bianford, 1873) – SW Iran (Zagros Mts).  
*P. a. rufipictus* (Severtsov, 1873) – C & E Tien Shan from extreme SE Kazakhstan E to extreme NW China (W Xinjiang).  
*P. a. martensi* (Eck, 1998) – Kali Gandaki valley, in C Nepal.  
*P. a. aemodius* (Blyth, 1845) – E Himalayas (from C Nepal), C China (S Gansu & S Shaanxi S to S Xizang and NW Yunnan) and N & E Myanmar.  
*P. a. pekinensis* (David, 1870) – E China (S Liaoning S to N Shanxi, Hebei and Shandong).  
*P. a. kuatunensis* (La Touche, 1923) – E China (S Anhui S to NW Fujian).  
*P. a. insularis* (Hellmayr, 1902) – S Kuril Is and Japan.  
*P. a. ptilosus* (Ogilvie-Grant, 1912) – Taiwan.



**Descriptive notes.** 10–12 cm; 7.2–12 g. Small, slim-billed, black-crowned tit (some races crested) with greyish upperparts and two wingbars. Male nominate race has forehead to crown (including crown side down to eye) and nape black, tinged bluish (in Balkans–W Turkey and in extreme SE Russia and Sakhalin, can possess a short, ragged crest), large white nuchal patch; cheek and ear-coverts white; upperparts deep bluish-grey (slightly paler blue-grey in Russia E to about L Baikal), tinged lightly olive-brown, more prominently brown to olive on rump and uppertail-coverts; tail dark grey-brown, all feathers finely fringed

paler or greyish-olive; upperside-coverts blackish-grey, broadly fringed bluish-grey, tips of median and greater coverts white, alula and primary coverts blackish, the latter fringed finely blue-grey (in fresh plumage); flight-feathers grey-brown, tertials finely fringed greyer and broadly tipped white, secondaries and primaries finely fringed grey or olive-grey, inner secondaries finely tipped white; chin and throat (including throat side) to side of upper breast black, breast and belly white, flanks to vent and undertail-coverts greyish to light cinnamon-buff; axillaries and underwing-coverts light buffish-white; in worn plumage, white nuchal patch can show some dark bases, upperparts duller or darker bluish-grey, pale fringes and tips of wing-coverts abraded and greyer, edges of flight-feathers worn or abraded, cheeks dingier, underparts also duller, dirty white on breast and belly and greyish-buff on flanks to vent; iris brown or dark brown; bill black, paler grey sides; legs lead-grey to dark bluish-grey. Female is similar to male but female has crown slightly less glossy, crown, mantle and scapulars a shade more greenish, wing-coverts duller or fringed greyer, and chin to upper breast brownish-black. Juvenile is similar to adult, but crown and nape sooty grey, nuchal patch smaller and more yellowish-white, upperparts dark grey with brownish or greenish-olive wash, median and greater coverts fringed dark grey and tipped off-white, flight-feathers as adult or fringed greenish or olive, cheeks washed pale yellow, chin to breast dark brown or greyer, rest of underparts yellowish except for pale buff flanks and undertail-coverts. Races differ mainly in depth and tone of plumage coloration: *britannicus* is as nominate, but in fresh plumage cheeks, ear-coverts and nape patch creamy white, upperparts greyish olive-buff and less bluish, edges of remiges and rectrices olive (and white tip only on upper tertial), bib slightly less extensive, flanks to vent and undertail-coverts pale rufous-buff to cinnamon-buff (paler when worn), variable, in Scotland upperparts olive-grey and flanks to undertail-coverts brownish-buff ("pinicolus"); *hibernicus* resembles previous, but upperparts dull greenish-olive (less buff), cheeks, ear-coverts, nape patch and underparts pale yellow (whiter when worn) except for warm buff to cinnamon-buff flanks and undertail-coverts, bib patch of female smaller; *vieirae* is as nominate, but upperparts washed olive-brown, flanks buffish-brown, tendency for juveniles to have larger area of sooty-brown bib; *sardus* is as nominate, but upperparts washed olive-brown in fresh plumage (slightly less olive-brown than previous), flanks to undertail-coverts pale buffish-brown; *atlas* is similar to nominate, but upperparts dull greyish-green, cheeks, ear-coverts and nape patch yellowish-white, bib slightly more extensive than other races (reaching to upper breast), lower breast and centre of belly yellowish-white, flanks deep buffish-grey; *ledouci* resembles last, but upperparts green with greyish-olive wash (slightly duller and greyer on female), cheeks, ear-coverts, nape patch, lower breast and belly washed pale yellow, flanks olive-grey; *moltchanovi* is similar to nominate, but bill slightly larger, mantle slightly paler blue-grey, underparts also paler, belly, flanks and undertail-coverts whitish; *cypristes* has black on head more extensive (white face patch more restricted), reaching to upper mantle, upperparts rich brown, tips of median coverts warm buff, edges of remiges and rectrices brownish, larger bib extending to centre of breast, breast to centre of belly pale pinkish-buff, flanks and lower underparts rufous-brown; *derjugini* has longer wing and bill than nominate, mantle slightly browner or greyer and lightly tinged olive, flanks to undertail-coverts light sepia-brown or greyer; *kichalowskii* is as nominate, but mantle and scapulars paler olive-brown, and flanks to undertail-coverts washed pale buffish; *gaddi* resembles last, but mantle and scapulars richer or darker brown, and flanks to undertail-coverts also washed darker buff-brown; *chorassanicus* is similar to previous, but mantle paler grey, tinged sandy brown; *phaenotus* is also similar to *gaddi*, but darker or more cinnamon-brown above, and has paler underparts, with buff on flanks to undertail-coverts; *rufipictus* is similar to nominate, but has short erect black crest, mantle slightly duller and greyer, tips of median coverts buffish or yellowish, tips of greater coverts pale buffish-white, also duller below, breast and belly pale pinkish-buff, flanks to undertail-coverts warm buffish-brown or buffish-tan, juvenile lacks crest, has crown and bib browner (bib often has smudged lower edge), yellowish wash on cheeks and ear-coverts, upperparts more olive-tinged; *aemodius* is as last, but has longer crest, paler underparts, extensively clear pinkish-buff on breast and belly; *martensi* is similar to last but slightly larger, has darker mantle and back, and underparts more reddish-ochre, except for grey flanks; *pekinensis* resembles nominate, but has short crest, buff wash on cheeks, ear-coverts and nape patch, olive wash on mantle, and paler underparts with



flanks greyer; *kuatunensis* is similar to previous, but has longer crest, nape patch nearly white, blue-grey upperparts faintly tinged olive on back, cheeks tinged pale buff, and underparts creamy buff with flanks greyish; *ptilosus* is very similar to last, but crest longer, upperparts slightly darker, and generally whiter or less buffish on underparts; *insularis* is as nominate, but tips of median upwing-coverts buffish, and underparts paler or more creamy to cream-buff. Voice. Calls include distinctive, mellow or plaintive "pui" or "tsuee" and variations with differing emphasis, including "sih", "sui" and "tsueueet", sometimes combined with other notes and run into longer phrases e.g. "swee-pi, sui-pi", and may conclude with drawn-out twitter; also thin "sisisi" similar to high-pitched note of Goldcrest (*Regulus regulus*), and especially in C Asia a more rapid "chit, chipippip" similar to that given by both *Parus major* and *Cyanistes caeruleus*; alarm notes include repeated series of sharp "pwee" or "peeh" notes, sometimes combined with series of harsher or more hoarse "szee", "zee" or "eez"; adults (usually mostly female) and feathered young give drawn-out hissing, similar to that of other parids, when predator in vicinity of nest; in N Africa, seemingly uniquely, a low churring or trilling "trrrrrrr" alarm. Song, in Mar–Sept, a 2-note or 3-note phrase repeated several times at varying speed and emphasis, "teehuu, teechuu", "tchuee-tchuee" or "chippie chip-pe", "peechee-peechee-peechee", "tu-wa-chi tu-wa-chi", "chi-chi-chi", "pe-twi pe-twi" and the like, also a more slurred but rhythmic "sit-tui, sit-tui, sit-tui". Male has up to 16 song types, each varying slightly from others, and these can be given in same song period or different ones given from one perch to another; little geographical variation, although on Cyprus (race *cypriotes*) song considered to be lower-pitched and slightly slower and includes some buzzing notes; female also sings, usually less loudly than male, but unaccompanied females can equal male.

**Habitat.** Conifer forests, mainly (in parts of range almost exclusively) in spruce (*Picea*), also mixed forest, often dominated by birch (*Betula*), and in pine (*Pinus*) and larch (*Larix*) in Siberia. In S Europe, Caucasus and NW Iran mostly in Aleppo pine (*Pinus halepensis*) or Calabrian pine (*Pinus brutia*), montane beech (*Fagus*) and oak (*Quercus*) forests, and in NW Africa mainly in junipers (*Juniperus*), cedars (*Cedrus*) and oaks, including holm oak (*Quercus ilex*), cork oak (*Quercus suber*) and zeen oak (*Quercus faginea*), also holly (*Ilex*), pines and gum juniper (*Tetraclinis articulata*); in Iran occurs locally also in high-altitude junipers. In C Asia, Himalayas and N China occurs in spruce, fir (*Abies*), hemlock (*Tsuga*) and birch and above tree-line in dwarf junipers, but in SC China more often in pines; in Europe often in conifer plantations and in urban and suburban areas with small numbers of conifers. In non-breeding season often in similar habitat, but also more frequently in deciduous woodland, parks and gardens. Breeds throughout much of W Palearctic from sea-level to c. 1800 m, exceptionally to 2050 m, but only above 500 m in Caucasus and above 1250 m in S Bulgaria, and in NW Africa at 1000–2500 m in Middle and High Atlas (Morocco); in N Iran occurs at 1220–2135 m; 2440–4000 m in NE Indian Subcontinent (exceptionally, to 4250 m in Nepal), 2745–3445 m in N Myanmar, 1220–2745 m in NW China, 2100–4570 m in SW China, and 800–1800 m in NE China and Korea; mostly at 600–2550 m in Japan but occurs down to sea-level on Hokkaido, and in Taiwan resident between 2000 m and 3500 m. In Himalayas, winters between 1800 m and 3810 m.

**Food and Feeding.** Food adult and larval bugs (Hemiptera), including aphids (Aphidoidea), also beetles (Coleoptera), lacewings (Neuroptera), flies (Diptera), caddis flies (Trichoptera), moths (Lepidoptera), damselflies (Odonata), bush-crickets (Orthoptera), bees and wasps (Hymenoptera), ants (Formicidae), spiders (Araneae), harvestmen (Opiliones), mites (Acari), millipedes (Diplopoda), centipedes (Chilopoda), slugs and small molluscs, and small earthworms (Oligochaeta); also seeds, preferentially of spruce (but often not available owing to unpredictability of cone crop), fir, pine, yew (*Taxus*), juniper, larch, redwood (*Sequoia*), cypress (*Chamaecyparis*), Japanese cedars (*Cryptomeria*), beech, sycamore (*Acer pseudoplatanus*), rowan (*Sorbus*), hornbeam (*Carpinus*), alder (*Alnus*), birch, walnut (*Juglans*), oak; also buds and catkins of willow (*Salix*), hazel (*Corylus*) and aspen (*Populus*), and sap of aspen, birch and maple (*Acer*). Regularly visits birdtables and feeders, where it takes nuts, seeds and household scraps, and has learnt to pierce or open milk-bottle tops to take cream. Size of insect prey usually up to c. 2–3 mm, exceptionally 6–7 mm, but caterpillars of 14 mm fed to nestlings. Diet of nestlings similar to that of adult but fewer seeds; in years of high caterpillar abundance these can form entire diet of nestlings, but generally fewer caterpillars in pine forest, where relies mainly on spiders. Seeds and hard-shelled insects rapidly and repeatedly stabbed with bill to remove outer husk or shell before softer parts eaten or taken for storage; also holds seeds in foot while tearing off outer layer. Stores food, mostly spruce seeds (or invertebrates when spruce seeds not available), between Jun and Dec (possibly also Apr), in lichen and bark crevices and holes in upper parts of trees and in base of hedges or holes in ground; cached food utilized in times of hard winter weather, but in parts of range only small part of winter diet is from stored food; at study sites recovery of stored food variable, from none at all to accidental refinding or considerable dependency, differing according to location and to severity of winter. Occurs alone, in pairs or in loose groups of pairs, and in non-breeding season highly social and often in fairly large groups of up to 50 individuals, more exceptionally flocks of hundreds or thousands recorded in Siberia; also joins mixed-species foraging flocks, which frequently include *Lophophanes dichrous*, *P. rufonuchalis*, Eurasian Treecreeper (*Certhia familiaris*), Goldcrest (*Regulus regulus*) and leaf-warblers (*Phylloscopus*). Actively and acrobatically forages mostly in upper levels of conifer trees, often perching on or hanging from cones and vertical needle clumps while extracting seeds with its fine bill, also flutters and hovers while gleaning insects from the outside of foliage; in deciduous trees more often examines branches, twigs and leaves (including undersides) for concealed insects; may also climb trunk vertically, and pursue slow-flying insects in flight. Frequently forages on ground, usually for fallen seeds and fruits of beech, sweet chestnut (*Castanea*) and oak; on snow-covered ground may forage in areas exposed by squirrels (Sciuridae) and wild pigs (*Sus*).

**Breeding.** Season end Mar to late Jul, later in N of range than in S; frequently two broods (though rarely so in deciduous woods), occasionally three, but only one in Corsica and N Africa. Monogamous, with lifelong pair-bond; members of one pair recorded together for 6 years. Territorial. Pair formation and display involve prolonged periods of wing-shivering and wheezing calls and slow gliding flight by male, with wings and tail fully spread, passing close to partner, followed by lengthy courtship feeding. Nest built by female alone, cup-shaped, made almost entirely of moss, some animal hair, wool and some feathers incorporated, placed in hole or cavity (usually with very narrow entrance) in tree trunk or old stump, including abandoned hole of rodent or woodpecker (Picidae), sometimes in hole or crevice in wall or rocks, in ground under stones, among roots of fallen tree or in mouse (Muridae) hole; holes in trees not usually excavated by pair but may be enlarged; nestbox occasionally used; size of territory not well studied but possibly small, radius c. 100 m in optimum habitats. Clutch 5–13 eggs, generally fewer in W Mediterranean, S & SE Asia and Japan, second clutches also smaller; incubation by female, period 14–16 days; chicks brooded by female, fed by both parents, nestling period 18–22 days, in Japan sometimes shorter (c. 16 days); recently fledged young remain together in thick cover for first few days out of nest, in contrast to behaviour of most other parids (young of which follow adults). Breeding success generally high: in studies in Germany, Corsica and Turkey, ratios of young fledged as percentage of eggs laid were 88–5% in spruce forest, 82% (first broods) and 87% (second broods) in larch plantations, 73% in cedar woodland, 57% in evergreen oak woodland, 78% in mixed woodland; ratios of young fledged as percentage of young hatched were 98% (first broods) and 99% (second broods)

in Scots pine (*Pinus sylvestris*), 92% (first broods) and 100% (second broods) in Corsican pine (*Pinus nigra*) and 99% in broadleaf woodland; loss of young to natural causes (other than predation) small compared with broods of *Parus major* and *Cyanistes caeruleus*. Breeds in first year.

**Movements.** Resident or makes short-distance altitudinal movements in S & W of range; N & E populations move longer distances, and occasionally irruptive. In British Is moves short distances, with very few recoveries at more than 20 km (most less than half this distance). Adults in Scandinavia and C Europe chiefly resident, but juveniles regularly migrate S or SW between late Aug and early Nov, mostly to S France and N Italy; in years when seed crop poor or fails, these S movements become much larger, often involving numerous large flocks totalling thousands of individuals (e.g. 35,000 at Hanko Bird Observatory, in S Finland, and more than 18,700 at Falsterbo, in S Sweden), usually during late Aug to early Oct; ringing studies reveal that flocks involved in these movements may travel up to 60 km per day, and may coincide with similar large-scale movements of *Poecile montanus* and Long-tailed Tits (*Aegithalos caudatus*); in irruption years some reach S & E coasts of British Is, and exceptionally NE Spain and Morocco; return passage movements usually Apr–May, occasionally into Jun. In W Russia may completely desert breeding area in some years and be present throughout (including in N parts) in others; small numbers also move N in autumn into N taiga forest and edges of tundra on shores of Arctic Ocean and Taymyr Peninsula, e.g. one ringed in Kaliningrad (W Russia) in Oct recovered 2000 km ENE in following Apr; similar pattern around Vladivostok, in SE Russia, with some present throughout year and small numbers moving S in Oct–Nov and returning mid-Mar to May. In NE China, regular autumn passage migrant at Beidaihe in Oct–Nov; in Korea (nominate race) and Japan (*insularis*) primarily altitudinal migrant, but *insularis* largely absent from Hokkaido (N Japan) in winter, when more numerous in Honshu and also at least occasional visitor to NE coast of China and Taiwan. Race *aemodius* a seasonal altitudinal migrant in Himalayas. Vagrant in Israel.

**Status and Conservation.** Not globally threatened. Common or fairly common in much of range; locally common in N Myanmar, and uncommon or scarce in Turkmenistan, Mongolia and SE China; recently discovered breeding in N Syria. SW Iranian race *phaenotus* either very rare or, possibly, extinct; has not been seen since it was originally discovered, in 1870. European breeding population between 13,000,000 and 27,000,000 pairs. Breeding densities variable, depending on habitat and, sometimes, on abundance of nestboxes; up to 50 pairs/km<sup>2</sup> in Scots pine plantation in E England, and twice that in optimum habitat elsewhere in Europe; in C Siberia, occurs at densities of 124–138 birds/km<sup>2</sup> in pine woods. Some expansion of range in NW Europe within 20th century, principally into W Scotland (Outer Hebrides), W Ireland, Scilly Is, Channel Is and W France; at same time has increased numerically in Britain, Belgium, Netherlands and Hungary, largely as a result of large-scale increase in commercial forestry plantations. In S Germany, small decline in numbers in spruce forest in Harz Mts owing to large-scale reduction in aphids and spiders caused by industrial pollution and acid rain.

**Bibliography.** Ali & Ripley (1983), Barnes (1975), Brazil (1991), Brown & Grice (2005), Cheng Tsohsin (1987), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Eck (1998), Échécopar & Hùe (1967, 1983), Fleming *et al.* (1979), Flint *et al.* (1984), Fry *et al.* (2000), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Harrap & Quinn (1996), Harrison (1982), Hartert (1905, 1921), Hollom *et al.* (1988), Hùe & Échécopar (1970), Inskipp & Inskipp (1991), Johansen (1944), King *et al.* (1975), Lee Woo-Shin *et al.* (2000), Löhrl (1974), MacKinnon & Philipps (2000), Martens & Eck (1995), Martens *et al.* (2006), McCarthy (2006), Meyer de Schauensee (1984), Murdoch (2005b), Perrins (1979), Porter *et al.* (1996), Rasmussen & Anderton (2005), Robson (2000), Rogacheva (1992), Smythies (1986), Snow (1955), Spierenburg (2005), Stepanyan (1990), Stuart Baker (1932), Svensson *et al.* (1999), Tomek (2002), Vaurie (1959), Wernham *et al.* (2002).

## 18. Yellow-bellied Tit

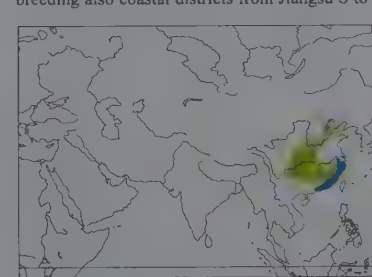
### *Periparus venustulus*

**French:** Mésange gracieuse **German:** Schmuckmeise **Spanish:** Carbonero Ventrigualdo

**Taxonomy.** *Parus venustulus* Swinhoe, 1870, gorges of Yangtze between Kweifoo (Sichuan) and Ichang (Hubei), east China.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Alternatively, has been combined with *P. elegans* and *P. amabilis* in a separate genus, *Pardaliparus*, and may form a superspecies with these two. Monotypic.

**Distribution.** EC & E China from NE Hebei S to S Gansu, C & E Sichuan and NE Yunnan, and from W Hubei S to NW Guangxi and E to S Anhui, C Hunan, N Jiangxi and N Guangdong; non-breeding also coastal districts from Jiangsu S to S Guangdong.



**Descriptive notes.** 10–11 cm; 9–12.5 g. Small tit with large head and short tail; black cap and bib and bright yellow underparts. Male has lores, forehead to crown (including crown side down to eye), nape and side of upper mantle black (crown glossed blue), long white nuchal patch variably extending to centre of upper mantle; cheek and ear-coverts to neck side pure white; centre and lower sides of mantle, scapulars and back bluish-grey, rump similar or slightly paler and greyer, longest rump feathers tipped olive-green, uppertail-coverts black, central feathers tipped olive-green; tail blackish-grey, narrowly fringed pale grey and finely tipped white, all rectrices except central pair with long segment of white on outer web towards base (amount of white increasing towards outermost feather); lesser upwing-coverts blackish-grey with thin glossy bluish fringe, median and greater coverts black, tipped white (greater sometimes with fine dark olive-green fringes), alula white with yellowish fringe; flight-feathers dark grey to blackish, secondaries and tertials finely fringed yellowish or yellowish-olive, tertials also tipped white or off-white (secondaries and primaries also finely tipped white in fresh plumage); chin and throat (including side of throat) to upper breast black (throat may be tipped yellowish or white in fresh plumage), rest of underparts yellow, slightly paler on undertail-coverts, washed olive on flanks; iris dark brown; bill black to bluish-black; legs lead-grey. Female is similar to male but generally duller, forehead and crown dull bluish-grey with darker centres (mottled appearance), side of crown also darker or greyer, sometimes a short and narrow pale line over and behind eye, nape grey with yellowish-white nuchal patch, mantle and scapulars olive-green, becoming greyish-olive on back and bluish-grey on rump, uppertail-coverts greyish, tipped bluish-grey; tail and wings as male, but lesser and median coverts edged olive-green and white tips of medians washed yellowish, edges of flight-feathers slightly more green than on male; cheek and ear-coverts off-white, narrow greyish malar stripe connecting with same colour on neck side; chin and throat white, underparts as male but slightly duller. Juvenile is similar to female but sexes separable at



early age: young male has forehead to crown, nape and upperparts olive-green, very short (and often indistinct) supercilium over eye, broad dark eyestripe and blackish nape side, pale yellow spot on centre of nape, duller or yellowish-tinged cheeks and ear-coverts, indistinct greyish malar stripe, pale yellow chin and throat, dull yellowish side of neck; juvenile female as juvenile male but has paler wings and tail, with tips of median and greater coverts tinged yellowish, cheeks and ear-coverts dingy yellowish-white, malar stripe poorly defined. **Voice.** Calls include thin and fairly soft "sit-oo", rapid and high-pitched "si-si-si-si", and frequently uttered nasal 3-note "dzee dzee dzee" which also extended into more varied "sip-eeh, sip, zee-zee-zee". Song mostly a series of single or disyllabic and rather metallic notes repeated in short phrases, "swi-swi-swi, suwi-suwi-suwi, sipu-sipu-sipu", or occasionally interspersed with more complex phrases, e.g. "spid-i-chu-sp-id-i-chu...", "wee-wa-chi, wee-wa-chi, wee-wa-chi...", "psi-wed-i, psi-wed-i, psi-wed-i" and similar.

**Habitat.** Broadleaf subtropical and evergreen forests, including mixed conifer and deciduous forest with bamboo, larches (*Larix*), willow (*Salix*) groves and other scattered trees at edges of cultivation; in non-breeding season more widely dispersed and may be found in almost any sizeable patch of trees. In summer at 1200–1500 m around Beijing, 500–2500 m in S Shaanxi, 600–2700 m in Sichuan, 350–1600 m in Guizhou and to 3050 m in S Gansu; outside breeding season usually below 1000 m, including on plains and near coast in E of range.

**Food and Feeding.** Diet not well known, but includes small invertebrates, larvae and seeds; known to store food, but details lacking. Usually in pairs or in small groups of up to four individuals (probably family parties); in non-breeding season gathers in higher numbers, with up to 30 recorded in single flock, and also joins mixed-species foraging flocks. Forages at middle to low levels in trees and undergrowth.

**Breeding.** Poorly known. Season at least May–Jun. Nest mostly of green moss, leaves, plant fibres, wool and animal hair, placed in natural hole or cavity in base of tree or among rocks, or in bank. Clutch 5–7 eggs; incubation by female, for up to 12 days; chicks fed by both sexes, nestling period 16–17 days; young become semi-independent after further 3 days.

**Movements.** Resident and altitudinal migrant; descends to lower levels in Nov–Apr non-breeding season. Appears to be an erratic or irruptive visitor in S & E, from Jiangsu S to Guangdong, with influx years followed by years with none at all. In recent years, recorded annually as a migrant at Beidaihe, on Gulf of Bohai (coastal NE Hebei), late Apr and May and late Sept to late Nov.

**Status and Conservation.** Not globally threatened. Locally common to rather uncommon. Considered to have declined as a result of large-scale forest clearance in China; reported as common in NW Fujian in mid-1920s, but not found there in summer 1986; uncommon also in NW Jiangxi in extensive area of forest still remaining. Recent records of regular passage in NE Hebei suggest that the species probably breeds also to the N of currently known range.

**Bibliography.** Cheng Tsohsin (1987), Échécopar & Hùe (1983), Harrap & Quinn (1996), Hartert (1905), King *et al.* (1975), Löhr (1987, 1988), MacKinnon & Philipps (2000), Martens *et al.* (2006), Meyer de Schauensee (1984), Vaurie (1959), Wittig (2004).

## 19. Elegant Tit

### *Periparus elegans*

**French:** Mésange élégante

**German:** Panthermeise

**Spanish:** Carbonero Elegante

**Taxonomy.** *Parus elegans* Lesson, 1831, Manila, Luzon, Philippines.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Alternatively, has been combined with *P. venustus* and *P. amabilis* in a separate genus, *Pardaliparus*, and may form a superspecies with these two. Described race *panayensis* (from Panay) possibly merits recognition; tentatively included in nominate, although bird forms from Panay are normally closest to Negros forms; further research required. Nine subspecies currently recognized.

#### Subspecies and Distribution

*P. e. edithae* (McGregor, 1907) – extreme N Philippine Is (Calayan, Camiguin Norte).

*P. e. montigenus* (Hachisuka, 1930) – NW Luzon, in N Philippines.

*P. e. gilliardi* (Parkes, 1958) – Bataan Peninsula, in WC Luzon.

*P. e. elegans* (Lesson, 1831) – EC & S Luzon, Mindoro, Catanduanes and Panay.

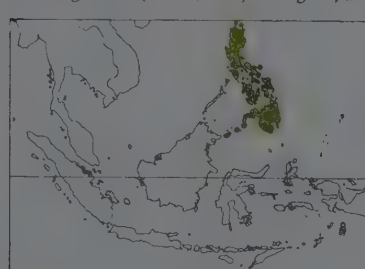
*P. e. albescentis* (McGregor, 1907) – C Philippines (Ticao, Masbate, Guimaras, Negros).

*P. e. visayanus* (Hachisuka, 1930) – Cebu, in SC Philippines.

*P. e. mindanensis* (Mearns, 1905) – EC & S Philippines (Samar, Leyte, Mindanao).

*P. e. suluensis* (Mearns, 1916) – Sulu Archipelago (except Bongao).

*P. e. bongaoensis* (Parkes, 1958) – Bongao I, in W Sulu Archipelago.



black, median and greater wing-coverts broadly tipped white, alula narrowly edged whitish, tertials broadly tipped white, secondaries and primaries finely tipped white (on outer webs only); chin and throat (including side of throat to below cheek) to side of upper breast black, forming bib, lower edge of which tipped pale yellow; rest of underparts yellow, paler on undertail-coverts, and rear flanks tinged greyish; axillaries and underwing-coverts white, fringed pale yellow; in worn plumage, crown less glossy, upperparts paler or whitish, pale fringes and tips of flight-feathers abraded, bib duller; iris reddish-brown to dark brown; bill black, bluish-grey base; legs pale blue-grey to dark bluish-slate. Female is similar to male, but crown slightly less glossy, nuchal patch smaller and duller yellow, mantle and scapulars greenish-grey and broadly spotted brownish-black (or with occasional yellowish-white spots on mantle), pale tips of tail smaller, upwelling-coverts duller and white tips smaller, flight-feathers fringed olive-grey; cheek to ear-coverts and neck side paler and duller, bib slightly smaller and browner, and underparts paler yellow. Juvenile male is similar to adult, but crown greyer, darker on side of crown and on upper nape and on nape side, nuchal patch smaller and dull yellowish-white, upperparts greenish-grey, scapular edges spotted darker, lores and cheeks dull yellow, becoming whiter on ear-coverts, short dark malar stripe, lacks dark bib, has underparts dingy yellow, lower mandible pale yellowish; juvenile female similar, but forehead and crown greyish-brown, nuchal patch small or poorly defined, usually larger dark spots on

scapulars, wingbars tinged yellowish, less white on tips of tertials, face dull yellowish, lacks malar stripe. Races well marked: *edithae* is as nominate but longer-billed, mantle blacker with reduced white spots, back and rump greenish-grey, cheeks, ear-coverts and nuchal spot white, underparts duller yellow; *montigenus* differs from nominate in having nuchal patch longer (extending to upper mantle), white spots on mantle smaller, underparts paler yellow, female more extensively greenish-grey (with fewer dark centres) on upperparts; *gilliardi* is as nominate, but male has nuchal patch, cheeks, ear-coverts and underparts deeper yellow, upperparts more broadly yellow (fringed blackish on mantle and scapulars), larger white tips on wing-coverts, tertials and rectrices, female very similar to male and with bib nearly as dark, but mantle and back tinged browner, tips of wing-coverts tinged yellowish, edges of primaries greenish-yellow; *albescentis* has large nuchal patch and upper mantle white, rest of mantle and scapulars broadly pale greyish-white, back and rump pale grey with yellow tinge, larger white tips of wing-coverts, tertials and secondaries, uniformly pale yellow underparts, female similar but with yellowish spots on upperparts (on Negros, male may have yellow wash on spots on back and rump, and female has crown paler, greater-covert fringes olive-green, smaller white tips of wing-coverts and tertials, flight-feathers fringed yellowish-olive, and bib slightly paler, not so black); *visayanus* differs from nominate in having more heavily spotted back, fewer spots on wings, dark greenish-grey flanks, female similar but greyer on flanks; *mindanensis* has nuchal patch yellow, mantle, back and scapulars blackish, heavily tipped or washed yellow, back and rump olive-yellow, wing spots and tail spots edged yellow, flight-feathers edged yellow or olive-yellow, female similar but cap sooty brown and extending to side of mantle, tips of wing-coverts and rectrices smaller, flight-feathers fringed olive-green, bib dark olive-green, underparts yellowish with olive-green wash; *suluensis* is similar to previous, but has greenish upperparts and grey-green scapulars, reduced yellowish spots on mantle (absent on female), slightly deeper yellow underparts; *bongaoensis* is as last, but male has mantle and back blacker, slightly fringed greenish, white tips of wing-coverts and rectrices smaller, flight-feathers fringed greenish. **Voice.** Calls include short "sit" or "sit-sit", thin "sisisi", and light and occasionally prolonged trilling "siiiiilililil", fading towards end; also a nasal "chay" and "si-si-si-tzee-tzee" and a series of mellow whistles, "twi-wi-wi-wi-wi-wi, tui-tui-tui-tui-tui"; on Luzon most frequent call an alternating "tweeet chuck-z-chuck-z-chuck-z", and on Mindanao race *mindanensis* gives more monotonous "sweet, sweet, sweet, sweet, sweet" or occasionally an alternating "chi-bow sweet-zee-sweet-zee-sweet-zee"; on Negros, call of *albescentis* a rapid "sweet-zee-sweet-zee-sweet-zee-zoo". Song "pi-tu, pi-tu, pi-tu", or longer and more complex variations on same theme, e.g. "pi-pi-tu, si-si pi-pi-tu, pi-pi-yu, si-si-si pi-pi-pi-tu"; also, apparently, a warbling song with muffled and buzzing trills, reminiscent of a canary (*Serinus*).

**Habitat.** Dense primary evergreen forest, including pine (*Pinus*) forest and moss forest, also edges of secondary forest and scattered trees at edges of cultivation. Lowlands to c. 2480 m.

**Food and Feeding.** Diet not well known, but includes small invertebrates and larvae, seeds, some fruit. Usually in pairs or in small groups of up to eight individuals; may join mixed-species foraging flocks with *Phylloscopus* warblers, fantails (*Rhipidura*) or Velvet-fronted Nuthatches (*Sitta frontalis*). Actively forages in middle to lower levels of forest trees and at canopy level in smaller trees and bushy shrubs.

**Breeding.** Poorly known. Adults in breeding condition in Jan–Jun, carrying nest material in Mar–Apr, and fledging in Apr and juveniles in Mar–Nov on Luzon, and juveniles in Apr and Oct on Mindanao. Nest includes moss, placed in hole or in hollow tree. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common or fairly common. Appears able to persist in suboptimal habitats.

**Bibliography.** Amadon & duPont (1970), Curio (1994), Delacour & Mayr (1945), Dickinson *et al.* (1991), Gill *et al.* (2005), Gilliard (1950), Gonzales & Sicala (1969), Hachisuka (1930), Harrap & Quinn (1996), Kennedy *et al.* (2000), Martens *et al.* (2006), Mearns (1916), Parkes (1958, 1963), duPont (1971), Ripley & Rabor (1958), Worcester & Bourns (1898).

## 20. Palawan Tit

### *Periparus amabilis*

**French:** Mésange de Palawan

**German:** Kapuzenmeise

**Spanish:** Carbonero de Palawan

**Other common names:** Black-headed Tit

**Taxonomy.** *Parus amabilis* Sharpe, 1877, Balabac, Philippines.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Alternatively, has been combined with *P. venustus* and *P. elegans* in a separate genus, *Pardaliparus*, and may form a superspecies with these two. Monotypic.

**Distribution.** Calauit, Palawan and Balabac, in W Philippines.



**Descriptive notes.** 12–13 cm. Medium-sized tit with all-black head and bright yellow underparts. Male has entire head to nape, neck side, throat and upper breast glossy black, mantle, back and scapulars bright lemon-yellow, rump blue-grey, and uppertail-coverts black with deep indigo-blue gloss; tail black, all feathers tipped white, outer web of outer three pairs distally white; lesser upwelling-coverts black, medians white, and greater black at bases but broadly white on distal half of feathers; alula and primary coverts black, finely tipped white, flight-feathers blackish or blackish-brown, tertials tipped white and fringed yellowish-white, secondaries and primaries finely tipped white (more broadly on secondaries), secondaries narrowly fringed pale grey; underparts from lower breast bright deep yellow, becoming paler on undertail-coverts, flanks washed olive; iris brown or dark brown; bill black; legs grey. Female is similar to male, but hood browner, narrow pale yellow collar on lower nape and side of neck, mantle and scapulars greenish-olive, back grey, rump bright yellow, usually less white in tail, lesser coverts dark grey, white on median and greater coverts reduced, tips of greater coverts more yellowish-white, underparts duller. Juvenile male is similar to adult female, with head and face olive-brown, small pale yellow nuchal spot, upperparts uniformly dull olive (no yellow collar), wing-coverts fringed olive or olive-green, wingbars also narrow (confined to feather tips) and yellowish, dark bib only faintly indicated, bill paler than adult; juvenile female differs from male in having tail browner, secondaries fringed yellowish-green. **Voice.** Calls frequently, and more often heard than seen; range includes thin "sit sisi", rapid and fairly harsh and repetitive "chuiwi-chuiwi-chuiwi-chuiwi...", "wichi-wichi-wichi-wichi" and similar, also accelerating rattle of repeated "wich-chi-chi-chi-chi-chi", an alternating "zuweet zuweet zuweet zuweet zuweet" or slightly more musical "tui-tui-tui-tui-tui", and a descending trill, "srlilililil". Song a repeated series of disyllabic "ti-da" notes, very like similar note of *P. ater*.



**Habitat.** Forests, including secondary forest, edges of swamps and cultivation, in lowlands and submontane regions.

**Food and Feeding.** Diet not well known, but includes small invertebrates and larvae, seeds, some fruit. Usually solitary, in pairs or in small groups; may join mixed-species flocks. Actively and conspicuously forages in canopy to middle levels of forest trees, and occasionally lower, to undergrowth and bushy shrubs; less frequently in scrub.

**Breeding.** Birds in breeding condition in May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Palawan EBA. Uncommon. Introduction of logging activity on the largely untouched island of Palawan raises concern for the species' long-term survival. Occurs in St Paul Subterranean River National Park.

**Bibliography.** Anon. (2006f), Butchart & Stattersfield (2004), Delacour & Mayr (1945), Dickinson *et al.* (1991), Gill *et al.* (2005), Hachisuka (1930), Harapp & Quinn (1996), Kennedy *et al.* (2000), Martens *et al.* (2006), duPont (1971), Stattersfield & Capper (2000).

Genus *LOPHOPHANES* Kaup, 1829

21. European Crested Tit

*Lophophanes cristatus*

**French:** Mésange huppée      **German:** Haubenmeise      **Spanish:** Herrerillo Capuchino  
**Other common names:** Crested Tit

**Taxonomy.** *Parus cristatus* Linnaeus, 1758, Sweden.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Relationship with *L. dichrous* uncertain; further study needed. Both were previously considered, on grounds mainly of morphology, to have close affinity with *Baeolophus wollweberi*. Has hybridized with *Periparus ater*. Geographical variation largely clinal; races *weigoldi*, *abadiei* and *mitratus* intergrade widely in W Europe; *baschkirikus* and *buresschi* are poorly differentiated from nominate, and considered by some to fall within range of variation of latter. Seven subspecies recognized.

**Subspecies and Distribution.**

*L. c. scoticus* Prazák, 1897 – NC Scotland.

*L. c. abadiei* (Jouard, 1929) – W France.

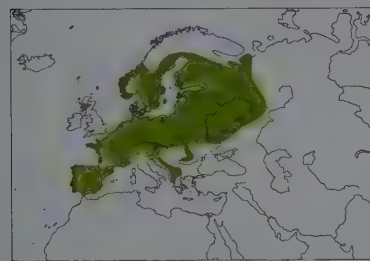
*L. c. weigoldi* (Trazt, 1914) – W & S Iberia.

*L. c. cristatus* (Linnaeus, 1758) – N & E Europe S to Carpathian Mts.

*L. c. baschkirikus* Snigirewski, 1931 – SW & C Urals.

*L. c. mitratus* (C. L. Brehm, 1831) – C Europe S to NE Spain, Alps, Croatia and N Serbia.

*L. c. buresschi* (Jordans, 1940) – Albania E to Bulgaria, and N & C Greece.



**Descriptive notes.** 11.5–12 cm; 9.7–15.8 g. Small to medium-sized, crested tit with black-and-white face pattern. Male nominate race has forehead to crown and short spiky crest black with broad white feather fringes (creating scaled appearance), fringes narrower on base of crest (crest shorter and fringes absent in worn plumage); narrow vertical black line on nape connecting with blackish collar on upper edge of mantle; upperparts mostly cold grey-brown, slightly warmer on uppertail-coverts and paler or greyer on upperwing-coverts; alula and flight-feathers dark grey to blackish, primaries finely edged grey; tail brownish-grey.

finely fringed grey-brown, outer web of outermost feather edged white; supercilium (flaring behind eye to include side of hindcrown), cheek, ear-coverts and neck side white, sometimes lightly washed buff, black eyestripe (indistinct in front of eye and not reaching base of bill) and rear edge of ear-coverts; chin, throat and centre of upper breast black, this narrowing at side to join with black line along upper mantle; rest of underparts mostly white, light buffish-grey on breast side, flanks and undertail-coverts; iris variably pale brown to deep red; bill black; legs olive-grey to bluish-grey. Female is very like male (and sexes not separable in the field), but has, on average, shorter crest, narrower stripes on head side, more buffish (less white) feather fringes on crown and crest, and more buff on flanks. Juvenile is very similar to adult, but has browner crown and shorter crest with more rounded tips, side of head washed buffish, eyestripe and rear edge of ear-coverts browner and less well defined, upperparts duller, bib browner with some whitish feather tips and not connected laterally to side of upper mantle. Racial variation slight: *baschkirikus* is very similar to nominate but paler and greyer, and faintly creamy (not buff) on flanks; *buresschi* is very like both nominate and previous, but has slightly duller and darker upperparts, yellowish flanks; *mitratus* differs from nominate in having upperparts cinnamon-brown (browner and greyer individuals also occur), rump and uppertail-coverts warmer brown with pinkish tinge, edges of wing-coverts and tail feathers cinnamon-brown, edges of flight-feathers grey-brown, off-white below, belly washed buffish, rest of underparts washed brownish-cinnamon; *scoticus* is similar to previous, but with dull fringes on forehead and crown, slightly duller or darker brown (not cinnamon) upperparts, also duller below, flanks and undertail-coverts washed browner; *weigoldi* resembles last, but pale fringes on head top broader and whiter (creamy on female), upperparts paler or greyer and less olive, underparts somewhat whiter; *abadiei* differs from last in having feather tips of forehead and crown washed buffish, cheek washed buffish, upperparts rich brown with rufous tinge, rump brighter orange-cinnamon, underparts strongly washed buff, flanks brighter cinnamon. **VOICE.** Most frequent call a thin, rising "zee-zee-zee-cheera-cheera" followed by low, tremulous purring "brrrrrr, t-brrrrrr...", introductory notes variable, sometimes "zizizi", "sizi-za, sizi-za, sizi-za" or a lighter "si-si-si-sisissisi" declining towards end; also a thin "see", singly or in series, and squeaky "sith, sith, silililili". Song a longer and louder version of the "tsee-tsee-tsee burrrrrl, burrrrrl" notes, variably introduced with high-pitched "seeh-i-" notes, and rapidly and frequently repeated.

**Habitat.** In N Europe occurs in stands of pine (*Pinus*) and spruce (*Picea*), mainly Norway spruce (*Picea abies*), also often in conifers in mixed woodland; in Scotland apparently confined to stands of old (more than 20 years) Scots pine (*Pinus sylvestris*) with some deciduous trees, principally birch (*Betula*) and alder (*Alnus*); in Belgium favours mature tall spruces and old pines, avoided by other parids. In C, S & SW Europe found in wider variety of habitats, including open woodland

with well-developed ground layer or shrubs and with good numbers of decaying trees and stumps (for nest-sites); in beech (*Fagus*) forest in Pyrenees, and in cork oak (*Quercus suber*) in S Iberia. In W Russia mostly in spruce and pine forests, avoiding broadleaf and mixed forests. In SE Europe favours high-altitude conifer forests, mostly of Norway spruce, also Greek fir (*Abies cephalonica*) and black pine (*Pinus nigra*). In non-breeding season may make short-distance movements to forage in areas of shrubby juniper (*Juniperus*) or heather (*Erica*, *Calluna*); locally, also in parks and orchards, and visits gardens. Occurs up to tree-line, to 615 m in Scotland; largely montane in S Europe, to 1800 m in Austria and at 1000–2300 m in Balkans and N Greece.

**Food and Feeding.** Food mostly small invertebrates and their larvae, and in non-breeding season seeds and some fruits. Invertebrate diet includes damselflies and small dragonflies (Odonata), stoneflies (Plecoptera), mayflies (Ephemeroptera), bugs (Hemiptera) including aphids (Aphidoidea), lacewings (Neuroptera), grasshoppers (Orthoptera), moths (Lepidoptera), flies (Diptera), caddis flies (Trichoptera), small bees, wasps and ants (Hymenoptera), beetles (Coleoptera), spiders (Araneae), earthworms (Oligochaeta) and snails (Gastropoda); usually heavily supplemented, principally in non-breeding season, by seeds of spruce, pine, fir and Douglas fir (*Pseudotsuga*), juniper, cypress (*Chamaecyparis*), beech, birch, aspen (*Populus*), rose (*Rosa*) and buckthorn (*Rhamnus*), berries of hawthorn (*Crataegus*), rowan (*Sorbus*) and dogwood (*Cornus*), and sap of birch, aspen and maple (*Acer*). Nestling diet principally spiders, but also some pine seeds. Stores food, mostly conifer seeds, larval lepidopterans and spiders, throughout year in holes and crevices in bark of tree trunks, also in clumps of lichens on branches (rarely on ground), items wedged in place or covered with saliva or gossamer, insects usually partly decapitated or otherwise paralysed and often stored while still alive; caches insect larvae chiefly in autumn, as food supply for winter; stores not relocated by memory but apparently sited in areas where individual likely to be foraging; caches often exploited by several individuals in winter social group. Usually solitary or in pairs; where densities fairly high, occurs in non-breeding season in small groups of up to six (exceptionally, twelve or slightly more), usually comprising one or more mated pairs and several, probably unrelated juveniles; also joins mixed-species foraging flocks with other tits, especially *Poecile montanus*, and Eurasian Treecreepers (*Certhia familiaris*) and Goldcrests (*Regulus regulus*). In Scotland, where density lowest, usually solitary in non-breeding season but may join roving bands of tits or other small insectivores as they pass through its territory. Active, agile and restless, occasionally inquisitive. Forages mostly in upper and canopy levels of conifers during summer; at other times descends to lower levels to feed in lower branches of saplings, in undergrowth and on ground, where forages for fallen seeds or insects, and in N of range feeds on ground beneath well-established clumps of heather during winter snow periods; often follows squirrels (Sciuridae) feeding on cones, and collects spilled seeds. Occasionally visits birdtables in areas close to breeding sites. Searches foliage and lichen clumps; clings to branches, and extracts seeds from cones while hanging upside-down from slender twigs or occasionally while hovering; also extracts grubs from behind bark or in dead wood.

**Breeding.** Season Mar–Jun; one brood, in S occasionally two. Monogamous, with lifelong pair-bond; in Russian study, estimated c. 90% of pairs formed by first-time breeders and widowed adults, and most pairs formed from within winter social group. Territory maintained and defended throughout year. Display includes courtship-feeding of female by male. Nest built by female, a cup of moss, lichens, animal hair, wool, feathers and gossamer, placed mostly within 3 m (exceptionally 13 m) of ground in hole in dead or decaying tree trunk, branch or stump, occasionally in living tree, old hole of woodpecker (Picidae), disused crow (Corvidae) or raptor nest or squirrel drey, sometimes in hole in fence post or in ground; nest-hole excavated or enlarged by pair, principally by female; nestboxes also regularly used; territory size not well known, but home range (most of which is territory) 6–11 ha in most of Europe, although in Scotland (where population sparse) extent of territorial defence indicates that territory apparently poorly defined. Clutch 5–11 eggs, smallest clutches in N of range; incubation by female, period 13–18 days; chicks fed by both parents, nestling period 16–22 days; young dependent on adults for up to further 23–25 days. Breeding success variable, average number of young fledged per brood 4.7 in Finland to 5.9 in S Germany, success rate generally lower for natural holes (reason unknown); main nest predator Great Spotted Woodpecker (*Dendrocopos major*), and in study in Pskov area (NW Russia) predation of nest-sites by woodpeckers 39–60% and average success 3.27 young per pair. Breeds in first year. Maximum recorded longevity (from ringing data) 7 years 7 months; annual adult mortality in Russian study 73%.

**Movements.** Largely resident; also nomadic in winter. In N of range occasionally wanders up to 100 km from breeding areas in non-breeding season, including to Lapland, S Kola Peninsula and mouth of R Pechora, and also S to Ukraine and Moldova. Vagrants recorded in C Siberia, Kazakhstan, England (also Scotland away from breeding areas) and Morocco.

**Status and Conservation.** Not globally threatened. Common or fairly common in most of range; uncommon and local in Scotland, and rare in W & NE Hungary. Estimated European breeding population 3,600,000–4,800,000 pairs, most of which (more than 1,000,000 pairs) are in Spain and Belarus. Throughout entire range, but more predominantly in N, population levels fluctuate in response to periods of severe winter weather. Densities vary from 48 pairs/km<sup>2</sup> in NE France, and 40 pairs/km<sup>2</sup> in pine woods in NW Spain and cork oak in Portugal, to 17 pairs/km<sup>2</sup> in mature pines in C Scotland (but only 1 pair/km<sup>2</sup> in mixed-age plantations) and 2–3 pairs/km<sup>2</sup> in pine-spruce forests in N Finland. Range has expanded W in C & S France, Belgium and Netherlands and N in Denmark and parts of Finland following increase and spread of commercial conifer plantations. Conversely, overall decline of c. 50% in population in Finland between 1955 and 1985 owing to modernization of forestry practices, and in same period a decline by c. 20% in Sweden and Czech Republic balanced by increases in Spain, Italy and Hungary. At study site in the Erzgebirge of E Germany, local declines of up to 30% (largely through increased adult mortality and reduced productivity) due to atmospheric pollution of conifer forests. In Scotland, range contracted during 18th century, following destruction of native Caledonian pine forest; some recovery in numbers occurred in latter half of 20th century, and population now stable at c. 900 pairs; despite abundance of new commercial forestry plantations, however, there has been no movement away from traditional range.

**Bibliography.** Barnes (1975), Brown & Grice (2005), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Échécopar & Hie (1967), Flint *et al.* (1984), Gibb (1960), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Gorman (1996), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Harapp & Quinn (1996), Harrison (1982), Hartert (1905, 1921), Jouard (1929), Lohrl (1991), McCarthy (2006), Perrins (1979), Rogacheva (1992), Svensson *et al.* (1999), Vaurie (1959).

22. Grey-crested Tit

*Lophophanes dichrous*

**French:** Mésange des bouleaux      **German:** Grauhaubenmeise      **Spanish:** Herrerillo Crestigris  
**Other common names:** Brown Crested Tit

**Taxonomy.** *Parus dichrous* Blyth, 1845, Nepal.



Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Relationship with *L. cristatus* uncertain; further study needed. Both were previously considered, on grounds mainly of morphology, to have close affinity with *Baeolophus wollweberi*. Race *wellsi* intergrades with both nominate and *dichroides* in S China. E Himalayan populations perhaps separable from nominate as race *izzardii*, on basis of longer wing. Four subspecies recognized.

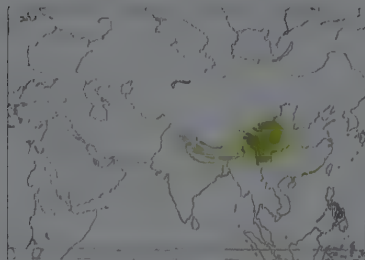
#### Subspecies and Distribution.

*L. d. kangrae* Whistler, 1932 - NW Himalayas (Jammu and Kashmir E to Kumaon).

*L. d. dichrous* (Blyth, 1845) - C & E Himalayas E to SW China (S Xizang).

*L. d. dichroides* Przevalski, 1876 - C China (E & S Qinghai, S Gansu and S Shaanxi S to N Sichuan).

*L. d. wellsi* (Stuart Baker, 1917) - S China (E Xizang E to N Sichuan and W & N Yunnan) and NE Myanmar.



**Descriptive notes.** 11.5–12.5 cm; 11.2–14 g. Medium-sized, plain grey tit with long erect crest and buffish underparts. Nominative race has pale buffish lower forehead, becoming grey on upper forehead and deeper grey on crown and crest; upperparts, including upperwing-coverts, mostly uniform plain grey, tinged buffish, except for dark grey upper edge of mantle; tail darker, brownish-grey, broadly fringed paler or buffish-grey; alula, primary coverts and flight-feathers blackish, finely fringed paler; lores, cheek and ear-coverts pale buff, finely tipped grey (mottled effect), rear and lower edges of ear-coverts greyer, fairly broad whit-

ish submoustachial stripe and buffish-white half-collar; chin and throat greyish-buff or greyish-brown; underparts orange-buff, sometimes tinged warmer brown, also whiter on belly and vent; in worn plumage, upperparts slightly darker grey and underparts paler buff; iris variably brownish-orange to crimson; bill dark grey to black; legs dark grey to bluish-grey. Sexes alike. Juvenile is similar to adult, but crest shorter, crest and upperparts slightly darker, rump tinged buffish, cheeks, ear-coverts and throat paler and less extensively buffish-brown. Racial variation slight: *kangrae* is as nominate, but upperparts slightly paler grey, face heavily flecked greyer, submoustachial paler and indistinct, neck side slightly paler, chin and throat greyish-buff (sometimes darker grey on lower throat) and contrasting with dull rufous or cinnamon-buff wash on rest of underparts; *wellsi*

has upperparts slightly darker grey than nominate, generally paler below, chin and throat to breast and belly dull pale buff (no contrast between throat and breast), variably rich cinnamon to pale cinnamon-buff on belly side, flanks and vent; *dichroides* is similar to last, but crown, crest and nape paler than dark grey upperparts, and underparts almost uniformly washed cinnamon-buff, paler on throat and breast and heavier on flanks. Voice. Fairly quiet. Calls include thin or high-pitched “zee” or “zai” and rapid but faltering “ti-ti-ti-ti” or “tirrit tizit tizit”, also softer “sip-sip-sip” or “sip-pi-pi” or “tsip-it, sit, tsit-tsit, scheip” or “tchuit psip cheeip-ptcheeip-scheip” together with more plaintive “pee-di” or “pi-diu”; alarm a rapid “chee chee”. Song mainly a series of “whee-whee-tz-tz-tz”, with various call notes and trills incorporated.

**Habitat.** Forests, in Himalayas including oak (*Quercus*) and rhododendron (*Rhododendron*) broadleaf forest, and mixed fir (*Abies*), hemlock (*Tsuga*), oak and rhododendron, pine (*Pinus*), spruce (*Picea*) and birch (*Betula*); in Myanmar in similar mixed fir forests but with bamboo and hydrangea. Breeds at 2400–3300 m in NW India, 2450–4000 m (possibly to 4270 m) in Nepal, 2440–3960 m in Sikkim, 2745–4240 m in Bhutan, to 2700 m in W Arunachal Pradesh, 2745–3200 m in NE Myanmar, and generally 2480–4000 m in SW China but at 2300–4570 m in Sichuan; also lower in non-breeding season, down to 2200 m in N India and at 2000–3600 m in Nepal and Bhutan, but many remain at higher levels, and regularly winters at 2440–3050 m in Sichuan.

**Food and Feeding.** Food apparently mostly invertebrates and larvae. Usually in pairs or small groups; occasionally pairs join mixed-species foraging flocks with other parids, particularly *Pariparus ater*, and leaf-warblers (*Phylloscopus*). Generally shy, fairly quiet and unobtrusive. Forages in middle to lower levels of forest trees, also in undergrowth and shrub layers; also on ground, especially in winter, when recorded collecting food items beneath dwarf rhododendrons and birch scrub.

**Breeding.** Season Apr to at least Jun. Nest a pad or small platform of moss, animal fur or hair and feathers, placed 3–7 m from ground in hole or cavity in tree trunk or old stump (may be excavated by nesting pair). Clutch 4–5 eggs; chicks fed by both parents. No other information.

**Movements.** Resident and short-distance altitudinal migrant. Some descend to lower levels (often within lower limits of breeding range) in non-breeding season, as in Nepal and Bhutan and elsewhere in Himalayas, but many remain at higher elevations unless forced by severe weather to move lower.

**Status and Conservation.** Not globally threatened. Uncommon in W Himalayas and S China, but fairly common in E Himalayas; locally common in N Myanmar. Occurs in several protected areas, including Foping Panda Reserve, in China.

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Choudhury (2003), Étiénnecopar & Hôe (1983), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmett *et al.* (1998), Harrap & Quinn (1996), Hartert (1905), Inskipp & Inskipp (1991), King *et al.* (1975), MacKinnon & Phillipps (2000), Mariens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Singh (1999), Smythies (1986), Spierenburg (2005), Stuart Baker (1932), Vaurie (1959).







# Genus *BAEOLOPHUS* Cabanis, 1850

## 23. Bridled Titmouse

### *Baeolophus wollweberi*

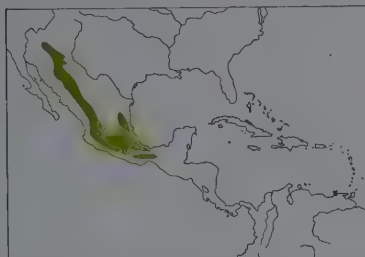
French: Mésange arlequin German: Zügelmeise Spanish: Herrerillo Embridado

**Taxonomy.** *Lophophanes wollweberi* Bonaparte, 1850, Zacatecas, Mexico.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment; present species has also been placed in *Lophophanes* by some, but molecular-genetic data indicate a much closer relationship to other members of present genus. Nominate race and *phillipsi* intergrade in NW Mexico; *caliginosus* often merged with nominate. Four subspecies recognized.

#### Subspecies and Distribution.

- B. w. vandevenderi* (Rea, 1986) – SW USA (C Arizona, extreme SW New Mexico).
- B. w. phillipsi* (van Rossem, 1947) – SW USA (SE Arizona) and NW Mexico (E Sonora, Chihuahua, N Sinaloa, N Durango).
- B. w. wollweberi* (Bonaparte, 1850) – C & S Mexico (Sinaloa and Durango and C Nuevo León S to Michoacán and Puebla).
- B. w. caliginosus* (van Rossem, 1947) – SW Mexico (Guerrero, Oaxaca).



**Descriptive notes.** 11.5–13.5 cm; 8.8–11.7 g. Medium-sized, crested tit with black-and-white face pattern and black bib. Nominate race has upper forehead and crown grey, sides of forehead and crown to short pointed crest blackish, nape (including side of nape) also blackish or tinged olive-grey; lower forehead, lores and supercilium white or whitish, extending in a band down behind ear-coverts to side of neck, narrow blackish line from eye along upper and rear edges of ear-coverts; cheek and ear-coverts white (or washed buffish), becoming greyer at rear; upperparts and tail grey or olive-grey, outer tail feather narrowly edged

whitish; upperwing as upperparts, tinged greyish-brown on lesser wing-coverts, flight-feathers grey-brown, fringed olive-grey; chin and throat black, underparts whitish-grey with yellowish-buff tinge, greyer on lower flanks; in worn plumage, crown darker, upperparts greyer, wings slightly browner, sometimes dark feather bases visible on cheeks and ear-coverts, and underparts whiter; iris brown; bill black; legs dark bluish-grey. Sexes alike. Juvenile is similar to adult, but crest shorter and blackish-grey, nape browner, upperparts pale grey-brown, flight-feathers edged off-white, supercilium to neck side off-white, cheeks and ear-coverts buffish-white, chin and throat dark grey, breast pale grey. Racial variation slight, and usually best detectable when comparing birds in fresh plumage: *phillipsi* is slightly smaller and paler grey than nominate, less olive on rump and edges of tail feathers, underparts paler grey (less yellow), but some regional variation, individuals with brighter upperparts and yellower underparts in S Arizona; *vandevenderi* is as previous, but upperparts slightly darker grey and with olive wash, underparts also darker, breast and flanks grey and centre of belly whitish (lacking yellow wash); *caliginosus* is similar to nominate but generally poorly marked, slightly darker olive-toned both above and below. VOICE. Calls include frequently given “chick-a-dee-dee”, also metallic “psit”, sibilant “sik” or sharper “tsik”, high-pitched “tsit” or “chit”, latter either singly or in rapid staccato rattle as “chit-it-it-it-it” or “tsi-tsi-si si si serr-eh-eh”; also a short “churr”, which may be run into longer chattering “ch-r-r-r-r-r-r-r-r-r-r”; usually shows strong reaction to calls (including imitations) of Mountain Pygmy-owl (*Glaucidium gnoma*). Song a monotonous and rapidly delivered repetitive series of “pli” or “chi” notes, also an upwardly slurred “cheewee” or “weet-weet” whistle repeated up to eight times.

**Habitat.** Evergreen montane forests of oak (*Quercus*), pine (*Pinus*) and juniper (*Juniperus*), occasionally also American plane (*Platanus occidentalis*), often in areas of dense scrubby forest; in Arizona breeds also in lower-level willows (*Salix*), cottonwood (*Populus*) and mesquite (*Prosopis*), and in winter spreads more widely into riparian woodland and occasionally in similar habitat in suburban and city parks. In USA occurs at c. 1500–2100 m, wandering to c. 2600 m; in Mexico mostly at 1000–3000 m, dispersing to higher levels (to at least 3200 m in C Mexico), and recorded rarely down to 560 m.

**Food and Feeding.** Diet not well known, but presumed to include small invertebrates and larvae. Food-caching recorded in captivity, but not documented for wild-living individuals. Usually in pairs, and after breeding forms family parties of up to ten individuals; later in autumn, parties may join together to form larger social groups; also found in mixed-species flocks. Tame, approachable and often confiding. Forages mostly in middle and lower levels of forest trees, spending most time in the interior around the bark and among branches, including slender twigs; also hangs from slender branches to examine underside of leaves. Rarely on ground.

**Breeding.** Poorly known. Season at least Apr to early Jun; probably single-brooded. Territorial during breeding. Nest an untidy mat or platform of leaves, lichens, plant down and fibres, and animal fur or human hair, placed up to 8.5 m above ground in natural hole or cavity in tree trunk or stump (oak most frequently used), or often uses old hole of woodpecker (Picidae) or nestbox. Clutch 5–7 eggs. No further information.

**Movements.** Resident, with some short-distance descent to lower levels in non-breeding season. During Sept to early Apr may be found at somewhat lower elevations, principally along river valleys, S & W of breeding range; few records beyond this immediate area, but wanders in USA occasionally to S New Mexico and in Mexico to NC Sonora. Vagrant in Texas.

**Status and Conservation.** Not globally threatened. Common or fairly common; locally abundant in Arizona. Some expansion of breeding range in Arizona; this countered by some withdrawal in non-breeding range owing to destruction of riparian woodland along R Gila and lower R Salt.

**Bibliography.** Anon. (1983b, 1998a), Bent (1946), Christman (2002), Farrand (1985), Gill *et al.* (2005), Harrap & Quinn (1996), Howell & Webb (1995), Nosedal & Ficken (1998a, 1998b), Phillips (1986), Phillips *et al.* (1964), Pyle (1997), van Rossem (1947).

## 24. Oak Titmouse

### *Baeolophus inornatus*

French: Mésange unicolore German: Schlichtmeise Spanish: Herrerillo Unicolor  
Other common names: Plain Titmouse (when treated as conspecific with *B. ridgwayi*)

**Taxonomy.** *Parus inornatus* Gambel, 1845, near Monterey, California, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *B. ridgwayi*, *B. bicolor* and *B. atricristatus*; until recently treated as conspecific with *B. ridgwayi*, but differs in morphology and voice. Nominate race and *affabilis* intergrade in SW California (USA). Race *mohavensis* sometimes merged with latter. Other proposed races, all in USA, include *sequestratus* (SW Oregon and NW California) and *kernensis* (drainage basin of R Kern and adjacent E slopes of Sierra Nevada, in California), both synonymized with nominate, and *transpositus* (SW California W of the deserts), merged with *affabilis*. Four subspecies currently recognized.

#### Subspecies and Distribution.

- B. i. inornatus* (Gambel, 1845) – SW USA (SW Oregon S to SW & SC California).
- B. i. affabilis* Grinnell & Swarth, 1926 – SW California and extreme NW Mexico (N Baja California).
- B. i. mohavensis* (A. H. Miller, 1946) – SE California (Little San Bernardino Mts).
- B. i. cineraceus* (Ridgway, 1883) – W Mexico (S Baja California).



**Descriptive notes.** 15–16 cm; 12.6–19.2 g. Large, grey tit with short crest. Nominate race has crown, crest and upperparts, including upperwing-coverts, grey-brown, back slightly warmer brown, rump slightly paler or buffish-brown, centres of greater coverts dark grey; tail dark grey-brown, fringed paler or greyer; flight-feathers dark grey, tertials, secondaries and inner primaries with fine grey-brown edges; forehead and lores to cheek and ear-coverts plain grey or mottled finely darker, neck side off-white, chin, throat and centre of upper breast pale grey, rest of underparts pale buffish-grey, becoming more buffish or light

brown on lower flanks and undertail-coverts; iris dark brown; bill dull dark grey; legs dull bluish-grey. Differs from *B. ridgwayi* in slightly smaller size, smaller bill, brown tinge in upperparts, and voice. Sexes alike. Juvenile is as adult, but may have paler tips on greater coverts, and tail feathers more pointed. Races vary little: *affabilis* resembles nominate, but bill larger, upperparts slightly dusky brown (less grey), underparts duller, flanks washed grey-brown, in SW California plumage slightly browner (“*transpositus*”); *mohavensis* is like previous but slightly paler or greyer, and flanks washed pale grey; *cineraceus* is as nominate, but on average slightly smaller (especially bill and tail), and has upperparts greyer and underparts paler. VOICE. Calls include soft “sip” or “sisip”, “sit-sit” or “si-si-pit” and “si si si chrr” and variations, including “tsitzi-tzer, tsitsi-tzer, tsitsitsi-tzer-zet”, often as a more scolding “see-jert-jert” or “tzer-zet-zet-zet”, and a thin high-pitched “see-see-see”. Song, mostly Feb–May in California, a repeated series of whistled “pli” or “tui” notes, often in combinations as e.g. “pee-chee pee-chee pee-chee” or a more prolonged “pli-pli, chuwi-chuwi-chuwi-chuwi, tsit-tsit-chiu, tsit-tsit-chiu, tsit-tsit-chiu”.

**Habitat.** Mostly lowland dry evergreen woodlands, mainly of oak (*Quercus*) but may also include pine (*Pinus*), juniper (*Juniperus*) or California laurel (*Umbellularia californica*); also in chaparral, riparian alders (*Alnus*) and fairly well-wooded suburban areas (in all cases, usually in vicinity of oaks). Occurs to c. 1100 m in N & C California, at 1340–2285 m (has occurred to 2440 m) in W California, and to c. 2050 m in S; at 500–2400 m in Mexico (Baja California).

**Food and Feeding.** Food includes small invertebrates and larvae; also acorns, leaf buds, catkins, and some fruit, principally berries. Usually solitary, in pairs and (for c. 1 month after fledging) in family groups, and may also join mixed-species flocks as these pass through pair’s territory. Fairly inconspicuous, and heard more often than seen. Forages in middle to upper level of forest trees, gleaning from among foliage and bark; able to strip away short sections of bark to reach insects. Occasionally, and mostly in non-breeding season, forages on ground. Also visits birdtables.

**Breeding.** Season late Mar to mid-Jul; one brood. Pair-bond maintained for life. Territory defended throughout year, particularly in spring and also after breeding (against incursion from wandering juveniles). Nest built by female, mostly of moss, plant fibres, bark strips, animal fur and feathers, placed 1–3 m above ground in hole or cavity in tree trunk, often in old hole of woodpecker (Picidae), and most frequently in oak, juniper or Joshua tree (*Yucca*); may adapt or excavate nest-site in rotten wood; nestbox or other artificial site frequently used; site often reused in subsequent years. Clutch 6–9 eggs, and female may roost on nest for up to a month before laying; incubation by female, fed by male during incubation, period up to 16 days; chicks fed by both sexes, most food brought by male, nestling period 16–21 days; young fed by parents for up to 28 days after leaving nest; juveniles often defend own territories from Aug onwards (exceptionally from Jun), but sites often unsuitable and usually abandoned before following spring, while some juveniles either wander or occupy marginal habitats until finding a suitable territory or an unmated territory-owner.

**Movements.** Mainly resident; some, possibly juveniles, make short-distance movements to lower levels at periphery of breeding range.

**Status and Conservation.** Not globally threatened. Considered to be common or fairly common throughout range.

**Bibliography.** Anon. (1983b, 1998a), Bent (1946), Cicero (1996, 2000, 2004), Dixon (1949), Farrand (1985), Gaines (1992), Gill *et al.* (2005), Harrap & Quinn (1996), Howell & Webb (1995), McCarthy (2006), Pyle (1997), Sibley (2000).

## 25. Juniper Titmouse

### *Baeolophus ridgwayi*

French: Mésange des genévriers German: Wacholdermeise Spanish: Herrerillo de Ridgway  
Other common names: Ridgway’s Titmouse; Plain Titmouse (when treated as conspecific with *B. inornatus*)

On following pages: 26. Tufted Titmouse (*Baeolophus bicolor*); 27. Black-crested Titmouse (*Baeolophus atricristatus*); 28. White-shouldered Black Tit (*Parus guineensis*); 29. White-winged Black Tit (*Parus leucomelas*); 30. Southern Black Tit (*Parus niger*); 31. Carp’s Black Tit (*Parus carpi*); 32. White-bellied Tit (*Parus albigentis*); 33. White-backed Black Tit (*Parus leuconotus*); 34. Dusky Tit (*Parus funereus*); 35. Rufous-bellied Tit (*Parus rufiventris*); 36. Cinnamon-breasted Tit (*Parus pallidiventris*); 37. Red-throated Tit (*Parus fringillinus*); 38. Stripe-breasted Tit (*Parus fasciiventris*); 39. Somali Tit (*Parus thruppi*); 40. Miombo Tit (*Parus griseiventris*); 41. Ashy Tit (*Parus cinerascens*); 42. Grey Tit (*Parus afer*).



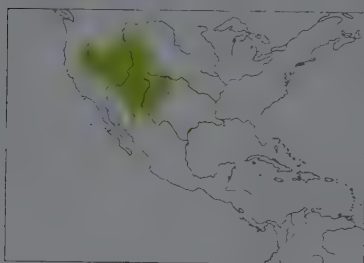
**Taxonomy.** *Parus inornatus ridgwayi* Richmond, 1902, Iron City, Utah, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *B. inornatus*, *B. bicolor* and *B. atricristatus*; until recently treated as conspecific with *B. inornatus*, but differs in morphology and voice. Race *zaleptus* poorly differentiated, and species sometimes treated as monotypic. Supposedly darker birds in S of range (S from NC Arizona and SW New Mexico) proposed as race *plumbescens*, but appear to fall within range of variation of nominate. Two subspecies recognized.

**Subspecies and Distribution.**

*B. r. zaleptus* Oberholser, 1932 – W USA (SE Oregon, E California, W Nevada).

*B. r. ridgwayi* (Richmond, 1902) – WC USA (S Idaho E to Colorado and extreme W Oklahoma, S to SE Arizona, New Mexico and extreme W Texas) and extreme N Mexico (NE Sonora).



**Descriptive notes.** 15–16 cm; 15.2–23.1 g. Large tit with short crest, grey upperparts and whitish underparts. Nominative race has crown, crest and upperparts, including upperwing-coverts, grey, centres of greater coverts dark grey; tail dark grey-brown, fringed paler or greyer; flight-feathers dark grey, tertials, secondaries and inner primaries with fine pale grey edges; forehead and lores to cheek and ear-coverts plain grey or whitish-grey, mottled finely darker, side of neck dull grey, tinged brownish; chin, throat and centre of upper breast whitish-grey, rest of underparts pale grey, becoming grey-buff on lower flanks and

undertail-coverts; iris dark brown; bill dull dark grey; legs dull bluish-grey. Differs from *B. inornatus* in slightly larger size, larger bill, grey (not brown) upperparts, and voice. Sexes alike. Juvenile is as adult, but may have paler tips on greater coverts and more pointed tail feathers. Race *zaleptus* is very similar to nominate, but in fresh plumage a little paler grey, tinged brown on nape, mantle and back, and whitish-grey below, sometimes slight buff tinge on flanks. Voice. Calls include soft “tup”, thin “sit” and scolding “churr-rrrrrrrr”. Song types include fast, rattling “jijiji jijiji jijiji...” on even pitch, sometimes interspersed with “chi-chi-chipu-chi-chi-chipu” whistles, also a monotonous, unmusical and rapid “pli-li-li-li-li-li” or “chwi-wi-wi-wi-wi-wi-wi”.

**Habitat.** Breeds in pinyon-juniper (*Pinus-Juniperus*) woodland, occasionally with oak (*Quercus*) intermixed, and in scrub oak woodland; in non-breeding season found in ponderosa pine (*Pinus ponderosa*) and more riparian areas, including alder (*Alnus*) and willow (*Salix*) thickets, and in dry sagebrush (*Artemisia*) scrub. To at least 2135 m in Arizona and at 1440–2440 m in New Mexico.

**Food and Feeding.** Food includes small invertebrates and larvae; also acorns, leaf buds and some fruit, principally berries. Usually solitary or in pairs, also in family groups, especially in non-breeding season; may join mixed-species flocks as these pass through breeding territory. Fairly inconspicuous, heard more often than seen. Forages in middle and upper levels of trees, gleaning from foliage and bark; occasionally on ground, mostly in non-breeding season. Behaviour and foraging actions very similar to those of *B. inornatus*, but in non-breeding season seen more often in small single-species flocks than in latter species.

**Breeding.** Not well documented. Season mid-Apr to late Jul. Nest made mostly of hair, grass, bark, moss and rootlets; placed 0.3–3.6 m above ground in hole or cavity in tree trunk, often in old hole of woodpecker (Picidae), and most frequently in juniper, but also in piñon and oak; nestbox or other artificial site frequently used. Clutch 6–7 eggs (3–9); incubation by female; incubation and nestling periods reported to be similar to those of *B. inornatus*, but no precise data available. No further information.

**Movements.** Mainly resident. Some, probably juveniles, make short-distance movements in Sept–Mar to lower levels at periphery of breeding range, including to base of Grand Canyon (Arizona); in W Texas more numerous in non-breeding season in Guadalupe Mts, and has occurred E to Davis Mts and El Paso.

**Status and Conservation.** Not globally threatened. Generally rather local or uncommon; rare in N Mexico (Sonora).

**Bibliography.** Anon. (1983b, 1998a), Bent (1946), Cicero (1996, 2000, 2004), Cooper & Gessaman (2004, 2005), Harrop & Quinn (1996), McCarthy (2006), Phillips (1959), Pyle (1997), Sibley (2000).

## 26. Tufted Titmouse

### *Baeolophus bicolor*

**French:** Mésange bicolore

**German:** Indianermeise

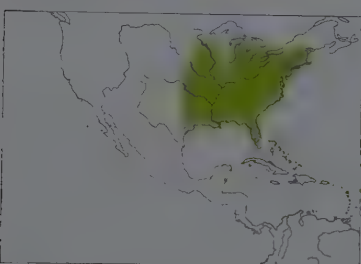
**Spanish:** Herrerillo Bicolor

**Other common names:** Eastern Tufted Titmouse

**Taxonomy.** *Parus bicolor* Linnaeus, 1766, South Carolina, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *B. inornatus*, *B. ridgwayi* and *B. atricristatus*. Was until recently treated as conspecific with last of these, and the two hybridize in a narrow zone in C Texas, but they generally differ somewhat in ecology; further study required. Monotypic.

**Distribution.** Extreme SE Canada (S Ontario) and E USA (SE Minnesota E to S Maine, S to C & E Texas and S Florida).



**Descriptive notes.** 11.5–14 cm; 17.5–26.1 g. Large, short-crested and fairly long-tailed grey tit. Has forehead to upper lores black, occasionally tinged rust-brown, crown and short pointed crest mid-grey with darker shaft streaks; upperparts, including upperwing-coverts, mid-grey, scapulars and back to uppertail-coverts tinged brownish-olive, centres of greater coverts dark grey; tail dark grey-brown, feathers fringed paler or greyer; flight-feathers mid-grey, tertials, secondaries and inner primaries with fine pale grey edges; lores whitish, tinged warm buff, cheek, ear-coverts and neck side plain whitish-grey; chin, throat

and upper breast white, washed pale grey, flanks rich rufous-buff, rest of underparts white with faint buffish wash; iris dark brown; bill black or dull dark grey; legs dull lead-grey. Differs from *B. atricristatus* mainly in black forehead and plain grey crest. Sexes alike. Juvenile is as adult, but has less black on forehead, upperparts tinged browner, breast greyer, and may have buffish tips on greater coverts and more pointed tail feathers. Voice. Fairly noisy; calls include loud, whistled “see-toit” and “seeja-wer” or “peta peta peta”, and variants such as harsher “day-day-day”, or

lower-pitched “tsee-day-day-day” similar to that of *Poecile carolinensis*; also an excited and high-pitched “tsi-tsi-tsi-sii-sii-zhree zhree zhree” and “tsit”, “sit-sit-sit” or “tset” contact notes, and in alarm a high-pitched “see-see-see”. Song, throughout year but mainly Feb–Sept, a whistled but slightly slurred “pli-piu” or longer and more drawn-out and descending “weedle petoo peeđu”, repeated up to ten times, also slower and more rolling “peeta-peeta-peeta-peeta” or “pli-pli-pli-pli-pli”; both sexes sing, but female much less than male and apparently only during summer months.

**Habitat.** Lowland, mature deciduous and mixed woods, including white oak (*Quercus alba*), hickory (*Carya*) and sweet gums (*Eucalyptus*), favouring riverine valleys, streams and wooded swamps; in non-breeding season, also edges of cultivation and well-wooded farmland, and suburban areas, orchards, parks, hedgerows and scrub; in E Texas more regularly in higher-level oak woodland, and around the Gulf coast and Florida in conifer forest and cypress swamps. Lowlands, to 1500 m in Tennessee and occasionally to 1200 m in Kentucky.

**Food and Feeding.** Diet chiefly small invertebrates and larvae, principally weevils and other beetles (Coleoptera), bugs (Hemiptera), ants, bees, wasps and sawflies (Hymenoptera), flies (Diptera), snails and other small molluscs (Gastropoda), spiders (Araneae), also orthopteran eggs; also seeds and nuts, mostly acorns during non-breeding season. In studies, c. 38% of annual food intake comprised caterpillars. Stores large quantities of food within territory during summer and autumn, mostly in deep crevices in bark, along branches or in ground. Usually solitary or in pairs; after breeding season occurs in small family groups, and in mixed-species foraging flocks when these present within territory. Active and generally fairly vocal, partners and family-members maintaining frequent contact. Forages at all levels in trees (often in canopy in spring and winter), in undergrowth and on ground, where it searches among fallen leaves. Gleans food from among foliage, including while hanging from slender branches (although less often at end of branch), and examines bark crevices; occasionally hovers. Commonly visits feeders and birdtables, where dominant over all other bird species with the exception of Blue Jay (*Cyanocitta cristata*).

**Breeding.** Season late Mar to mid-Jun; occasionally two broods. Monogamous, pairs for life; single helpers noted as assisting with feeding of young at some nests. Territory defended pugnaciously throughout breeding season by resident pair, sometimes with one or two juveniles from previous season (may be defended also in non-breeding season, or small flocks of up to eight unrelated individuals may also be present within territory); sometimes two pairs (or two distinct breeding territories) within a larger territorial area, usually a dominant pair, and a second pair formed between members of previous winter's flock, and in such instances dominant pair usually establishes breeding territory up to a month ahead of second pair. Courtship display includes mutual wing-quivering, and feeding of female by male. Nest built by female, a cup mostly of leaves, moss, strips of bark, grass and animal hair, also rags, string and shed snakeskin incorporated, placed 6–20 m above ground in natural hole or cavity in living or dead tree, often old hole of woodpecker (Picidae), or hole in rotten tree stump or fence post, or hollow metal pole or nestbox used; same nest-site may be used for several years in succession; size of territory variable, 3.2–5 ha. Clutch 5–7 eggs; incubation by female, fed on nest by male, period 12–14 days; chicks fed by both parents, nestling period 15–18 days; juveniles continue to be fed by adults for up to 8 weeks; if two broods, young from first brood help to care for and feed second brood. Maximum recorded longevity 13 years 3 months.

**Movements.** Resident; some short-distance movements. Evidence from ringing shows that very few move more than 30 km from site where ringed. Some post-breeding dispersal and wandering in non-breeding season, from Sept/Oct to about Feb/Mar; irregular visitor to N Minnesota, N Wisconsin and W Texas, and in Canada rare visitor in S Quebec (but at least 50 recorded in irruption in winter 1990/91) and vagrant in New Brunswick.

**Status and Conservation.** Not globally threatened. Generally common to locally common or locally scarce; rare to scarce in small Canadian part of range (S Ontario). Range expanded slowly N in 20th century; first recorded in Iowa and Wisconsin in early 1900s, and in Canada first record in May 1914 and first confirmed breeding in 1955 (possibly bred earlier, in 1932 and 1936), but subsequent increase in Canada very slow. Since 1946 has colonized New England, where now common in S, and from 1954 spread into N Pennsylvania and New York.

**Bibliography.** Anon. (1983b, 1998a), Avise & Zink (1988), Bent (1946), Braun *et al.* (1984), Dixon (1955, 1978), Farrand (1985), Gill & Slikas (1992), Gill, Funk & Silverin (1989), Gill, Slikas & Sheldon (2005), Godfrey (1986), Grubb & Pravosudov (1994), Harrop & Quinn (1996), McCarthy (2006), Pielou (1957), Pravosudova *et al.* (2001), Pyle (1997), Sibley (2000).

## 27. Black-crested Titmouse

### *Baeolophus atricristatus*

**French:** Mésange à plumet noir

**Spanish:** Herrerillo Crestinegro

**German:** Schwarzhäubchenmeise

**Taxonomy.** *Parus atricristatus* Cassin, 1850, Rio Grande, Texas, USA.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *B. inornatus*, *B. ridgwayi* and *B. bicolor*. Was until recently treated as conspecific with last of these, and the two hybridize in a narrow zone in C Texas, but they generally differ somewhat in ecology; further study required. Races intergrade widely in overlap zones; proposed race *dysleptus* in S USA (W Texas) and adjacent N Mexico (S to Sierra del Carmen, in Coahuila) synonymized with *paloduro*. Birds of race *sennetti* have been referred to using the older names *castaneifrons* and *texasensis*, but both of these older names appear to be based on hybrids. Three subspecies recognized.

**Subspecies and Distribution.**

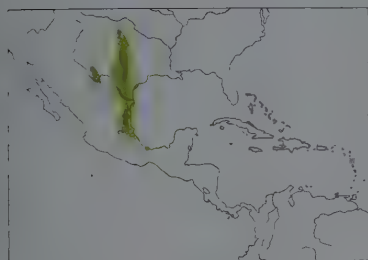
*B. a. paloduro* Stevenson, 1940 – S USA (N Texas, SW Oklahoma), also SW Texas (Trans-Pecos) S to N Mexico (extreme E Chihuahua, NW Coahuila).

*B. a. sennetti* Ridgway, 1904 – C & S Texas.

*B. a. atricristatus* (Cassin, 1850) – S Texas (Rio Grande Valley) and NE Mexico.

**Descriptive notes.** 14.5–15 cm; 15.5–20.9 g. Large, fairly long-tailed tit with black pointed crest and grey upperparts. Male nominate race has forehead whitish or pale buffish (sometimes a narrow dark line on centre), crown and crest black; upperparts, including upperwing-coverts, light grey to medium grey and tinged light olive, rump tinged olive-brown, centres of wing-coverts dark brownish-grey; tail dark brownish-grey, all outer feathers broadly fringed olive-grey; flight-feathers brownish-grey, all except outer primaries with fine pale grey edges; lores and area around eye whitish, cheek, ear-coverts and neck side plain whitish-grey; underparts mostly whitish, upper breast washed pale grey, flanks rich orange-buff or cinnamon, undertail-coverts washed buffish; in worn plumage, upperparts slightly paler grey but wings and tail browner and fringes abraded or paler, underparts duller, flanks paler; iris dark brown; bill black; legs dull bluish-grey. Distinguished from *B. bicolor* mainly by white forehead and black crest. Female is very like male, but crown and crest duller or less black, and crest shorter on average. Juvenile differs from adult in having forehead greyish-white, crown to (shorter) crest greyer, upperparts tinged browner, underparts washed dull





peew peew peew peew" or "pete-chee-chee-chee"; alarm a thin "see-see-see" or "sit-sit-sit"; calls similar to those of *B. bicolor* but louder and generally more nasal. Song a repeated, mellow, ringing "chew chew chew" whistle or variations, including "chee-u chee-u chee-u" or more slurred "p-lu p-lu p-lu" or "peter, peter, peter..." with second note higher; individual male may have up to twelve different song types.

**Habitat.** Mainly lowland dry forest, particularly mesquite (*Prosopis pubescens*) and scrub, including riparian woodland, e.g. cottonwoods (*Populus*), also juniper-oak (*Juniperus-Quercus*) woodland, possibly also mesquite and thorn-scrub; in Mexico, occurs on edges of evergreen forest in W Tamaulipas and in pine-oak/pinyon-oak (*Pinus-Quercus*) woodlands and forest in drier interior. In USA, occurs at 750–1065 m in S Oklahoma and W Texas, and 305–2135 m in Trans-Pecos and 1525–1675 m in Davis Mts, but generally below 750 m in S & SW Texas (down to c. 300 m in non-breeding season) and on coastal plain of E Mexico; in Mexico occurs to 1525 m in Hidalgo, to 1675 m in San Luis Potosí and at 1460–2285 m in NE Coahuila, and down to 150 m in Veracruz.

**Food and Feeding.** Diet chiefly small invertebrates and larvae, principally insects and spiders (Araneae); also some fruit, mainly berries, and during non-breeding season nuts, mostly pecan nuts (*Carya illinoensis*) and acorns. Usually solitary or in pairs in breeding season; forms small family parties of up to eight individuals in autumn and winter. Actively forages at all levels in trees (often in canopy in winter), in undergrowth and on ground; gleans food from among branches and foliage.

**Breeding.** Season late Feb to early Jun. Nest, usually built entirely by female, mostly of moss, grass, lichens, leaves, bark strips, animal hair and feathers, placed up to 7 m above ground in hole or cavity in (usually living) tree or old stump or in post (including telephone pole), frequently in old hole of woodpecker (Picidae) or nestbox; may reuse site in subsequent years. Clutch 6–7 eggs; incubation by female. No other information.

**Movements.** Mainly resident; occasional short-distance movements both to higher and to lower elevations in non-breeding season.

**Status and Conservation.** Not globally threatened. Generally common; uncommon in S parts of range in Mexico.

**Bibliography.** Anon. (1983b, 1998a), Avise & Zink (1988), Bent (1946), Braun *et al.* (1984), Dixon (1955, 1978), Gill & Slikas (1992), Gill *et al.* (1989), Grubb & Pravosudov (1994), Harrap & Quinn (1996), Howell & Webb (1995), McCarthy (2006), Pyle (1997), Sibley (2000).

## Genus *PARUS* Linnaeus, 1758

### 28. White-shouldered Black Tit

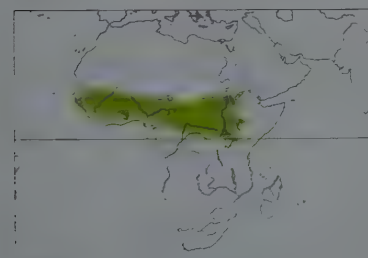
#### *Parus guineensis*

**French:** Mésange galonnée **German:** Guineameise **Spanish:** Carbonero Guineano  
**Other common names:** White-shouldered Tit

**Taxonomy.** *Parus leucomelas guineensis* Shelley, 1900, Volta River, Ghana.

Forms a superspecies with *P. leucomelas*, *P. niger*, *P. carpi* and *P. albiventris*, possibly also including *P. leuconotus*. Often considered conspecific with *P. leucomelas*, and the two occur in mixed flocks in Uganda, but they differ in eye colour, and no evidence of intergrades; further research required. Monotypic.

**Distribution.** S Senegal and S Mauritania E to S Sudan and N Eritrea, S to C Ivory Coast, SE Cameroon, N DR Congo, Uganda and extreme W Kenya.



**Descriptive notes.** 14 cm; 12.9–21 g. Large, dumpy, glossy black tit with short bill, pale eye, and large white patch on wing-coverts. Male has entire body and tail black (in fresh plumage, slight bluish gloss on upperparts to uppertail-coverts, and on neck side to breast), sometimes a short and untidy crest; tail slightly more sooty black, feathers glossed bluish-black on fringes, sometimes very narrow whitish fringe or tip on outermost two; lesser upperwing-coverts black, tipped white, median and greater coverts contrastingly white (greater with concealed dark shaft streaks) except for blackish outermost greater coverts; alula and primary coverts black, finely fringed or tipped white, flight-feathers blackish-brown, fringes of upper tertials glossy bluish, white on lowest tertial, secondaries broadly fringed white (forming, with that on wing-coverts, a broad white panel on closed wing), primaries narrowly fringed white or whitish; axillaries and underwing-coverts white; in worn plumage duller (less glossy) overall, and white in wing duller and abraded, with darker centres visible; iris mostly white to yellowish-white, sometimes pale buffish-brown; bill black; legs dark brown to bluish-grey or black. Distinguished from *P. leucomelas* by slight differences in glossy tinge and by pale eyes. Female differs from male only in having slightly smaller white patch in wing. Juvenile is as adult, but upperparts brownish-black, wings and tail sooty black, white on wing-coverts replaced by yellowish-white and often broader dark brown centres on outers (outermost greater coverts as adult), lowest tertial and edges of secondaries broadly yellowish-white and primary edges narrowly so, iris dull grey-

green to brown, bill may have some yellowish-white at base. **Voice.** Vocal; most frequent call a loud and rather harsh or rasping "churr" often introduced by 1–2 softer "chip" notes, also a nasal "dzwee, dzwee, dzwiu" or "ziu, dziu, dziu" repeated at intervals or when agitated or alarmed; other notes include thin "sisisi-pee" and harsh, grating "chut-chut"; calls very similar to those of *P. leucomelas*. Song a ringing series of whistles, "sree, tip-tu-wip, tu-wip, tu-wip, yu-wip" or variations, including "huwee-tee-huwee-tee-huweeh", "swip-pedu-wip, ped-du-wip..." and "way-teetwer-teetwer", "tee-tooyoo, tee-tooyoo, tee-tooyoo".

**Habitat.** Mature acacia (*Acacia*) savanna and open woodlands, grassland and thorn-scrub, including open areas of savanna within rainforest zone, edges of cultivation (but generally avoids agricultural areas) and in S Uganda more heavily wooded areas; in Eritrea occurs in highland juniper (*Juniperus*) woods and riparian thickets and gallery forest along rivers and streams. Lowland plains and hills, to 1220 m in Cameroon, to 1650 m in Eritrea, and above 1000 m in W Kenya.

**Food and Feeding.** Food includes small invertebrates and larvae, seeds and some fruit. Usually in pairs or in small groups (probably family parties) of up to eight individuals; also one of the main species in mixed-species foraging flocks in parts of W Africa. Active, and always on the move; generally shy. Forages in interior of middle level of trees, preferring to search trunk and branches rather than in foliage; may occasionally pursue and catch insects in flight.

**Breeding.** Poorly known. Season Jan–Jun/Jul. Nest placed up to 1 m from ground in hole in tree. No other information.

**Movements.** Mainly resident; scarce rainy-season visitor to S Mauritania.

**Status and Conservation.** Not assessed. Common or fairly common except along N & W boundaries of range. Rare (no recent records) on upper R Gambia but scarce or local on lower river; also scarce or uncommon in Mali and extreme SW Niger; common throughout most of Ghana but absent from coastal thickets. In Burkina Faso known only from Arli-Pendjari National Parks, where fairly common. Scarce in NE Central African Republic, NE Uganda and E Sudan, but locally common in N Uganda; rare in Eritrea and W Kenya.

**Bibliography.** Barlow & Wacher (2005), Borrow & Deme (2001), Britton (1980), Dowsett & Dowsett-Lemaire (1993), Elgood *et al.* (1994), Fry *et al.* (2000), Harrap & Quinn (1996), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1973), McCarthy (2006), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996), Zinner (2001).

### 29. White-winged Black Tit

#### *Parus leucomelas*

**French:** Mésange à épaulettes **German:** Rüppellmeise **Spanish:** Carbonero Aliblanco  
**Other common names:** (Common) Black Tit, White-winged Tit

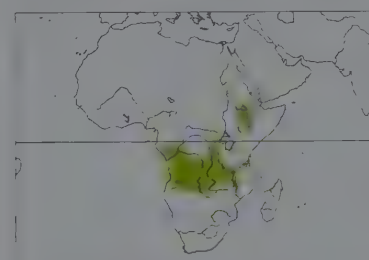
**Taxonomy.** *Parus leucomelas* Rüppell, 1840, Halei Province, Temben, Ethiopia.

Forms a superspecies with *P. guineensis*, *P. niger*, *P. carpi* and *P. albiventris*, possibly also including *P. leuconotus*. Often treated as conspecific with *P. guineensis*, and the two occur in mixed flocks in Uganda, but they differ in eye colour, and no evidence of intergrades; further research required. Possibly closer to *P. niger*, and sometimes considered conspecific with it, but the two appear not to interbreed in area of range overlap in Malawi and Zambia. Two subspecies recognized.

**Subspecies and Distribution.**

*P. l. leucomelas* Rüppell, 1840 – C & SE Ethiopia.

*P. l. insignis* Cabanis, 1880 – S Gabon and S PR Congo E to E DR Congo, SW Uganda, W Rwanda, N Burundi and NW & C Tanzania, S to Angola, Zambia and Malawi.



**Descriptive notes.** 15–16 cm; 21–24 g. Large, glossy black tit with dark eyes and large white patch on wing-coverts. Male nominate race has entire body and tail black (in fresh plumage, crown to uppertail-coverts glossed bluish or bluish-purple, slight gloss on side of neck to belly, less visible on flanks and undertail-coverts), sometimes a short and ragged crest on hindcrown; fringes of all tail feathers glossed bluish-black, faint narrow pale edge on outermost; lesser upperwing-coverts black, median and greater coverts contrastingly white (both have concealed black bases) except for blackish outermost greater coverts; alula and primary coverts black, finely fringed or tipped white, flight-feathers blackish-brown, fringes of upper tertials glossy bluish, white on lowest tertial, secondaries broadly fringed white (forming broad white panel on closed wing), primaries narrowly fringed white or whitish; axillaries black, underwing-coverts black with white tips; in worn plumage duller (less glossy) overall, white in wing duller and abraded, and darker centres of greater coverts visible; iris dark grey or brown; bill black; legs dark brown to bluish-grey or black. Distinguished from *P. guineensis* by slight differences in glossy tinge and by dark eyes; from *P. niger* by blacker general plumage, especially on belly to undertail-coverts, and more solidly white greater coverts. Female is very like male but duller, less glossy, and with underparts sooty black. Juvenile is as adult, but upperparts blackish-brown, wings and tail sooty black, white on wing-coverts replaced by yellowish-white, broader dark brown centres of greater coverts visible (outermost greater coverts as adult), lowest tertial and edges of inner secondaries broadly white, fringes of outer secondaries and narrower fringes of primaries tinged yellowish-buff. Race *insignis* differs from nominate in having gloss on body plumage bluish to bottle-green, tail feathers (except central pair) often with very narrow whitish fringe or tip, underwing-coverts more extensively white. **Voice.** Calls include shrill and abrupt "chut" or "chit", usually as introduction to buzzing "chit-zzzzz-r" or "chut-drrrrrr-du" and lower-pitched "chik-zworrtrr, chik-zworrtrr", also more musical "tszee-tuuu, tszee-tuuu" and "pss-tyoo-yoo, pss-tyoo-yoo". Song a "ter-si, du, l-l-l-l-l-tuwi" or "wheee-to-trrrr-tooe" whistle, rather similar to that of a *Turdus* thrush.

**Habitat.** In Ethiopia (nominate race), found in dry podocarpus forests of juniper (*Juniperus*) and olive (*Olea*) in highlands and in lower-lying subtropical riverine forest and acacia (*Acacia*) thornbush savanna; to c. 2750 m. In C Africa principally in grassland savanna with acacia thornbush, occasionally in miombo or secondary brachystegia (*Brachystegia*) woodlands, and in Malawi also in riparian scrub and montane grassland with scattered trees, also edges and clearings in light miombo woodland and edges of acacia savanna; in coastal Angola occurs in mistbelt woodland below the escarpment. Generally above 915 m, to at least 1860 m in DR Congo, to 2040 m in Zambia and S Malawi; to 2000 m in E Africa but in places may occur at lower levels, down to 760 m near L Tanganyika.

**Food and Feeding.** Food includes small invertebrates and larvae, also seeds and some fruit, in particular custard-apple fruit (*Annona*). Usually in pairs or in small groups (probably family parties) of up to six individuals; also in fast-moving mixed-species foraging flocks containing small



warblers (Sylviidae) and Spotted Creepers (*Salpornis spilonota*). Actively and diligently forages in interior of tall trees, preferring to search trunk rather than foliage; clings sideways and hangs upside-down, probes crevices in bark and branches; occasionally pursues insects in flight.

**Breeding.** Season Mar–Dec, possibly throughout year. Monogamous, solitary breeder. Nest a pad or small platform of grass and lichens, placed up to 4 m above ground in hole or cavity in tree trunk or stump; holes in walls of buildings occasionally utilized. Clutch 3–5 eggs; incubation by both sexes, and young fledge at c. 26 days. No other information.

**Movements.** Resident; vagrant to N Mozambique (at 570 m).

**Status and Conservation.** Not globally threatened. Generally common or locally common throughout its range.

**Bibliography.** Benson *et al.* (1959), Borrow & Demey (2001), Britton (1980), Carswell *et al.* (2005), Dowsett & Dowsett-Lemaire (1993), Dowsett-Lemaire & Dowsett (2006), Fry *et al.* (2000), Hall (1960), Hall & Moreau (1970), Harrap & Quinn (1996), Mackworth-Præd & Grant (1973), McCarthy (2006), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

### 30. Southern Black Tit

#### *Parus niger*

French: Mésange nègre

German: Mohnenmeise

Spanish: Carbonero Negro

**Taxonomy.** *Parus niger* Vieillot, 1818, Sunday River, Eastern Cape Province, South Africa.

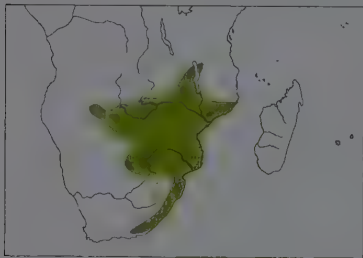
Forms a superspecies with *P. guineensis*, *P. leucomelas*, *P. carpi* and *P. albiventris*, possibly also including *P. leuconotus*. Has been considered conspecific with *P. leucomelas*, but the two appear not to interbreed in area of range overlap in Malawi and Zambia. Races intergrade widely and boundaries imperfectly known. Three subspecies recognized.

**Subspecies and Distribution.**

*P. n. xanthostomus* Shelley, 1892 – SE Angola, C & S Zambia, SW Tanzania, NE Namibia, N & E Botswana and N South Africa (North West Province).

*P. n. ravidus* Clancey, 1964 – E Zambia, Malawi, Zimbabwe and C Mozambique S to extreme N South Africa (N Limpopo Province).

*P. n. niger* Vieillot, 1818 – S Mozambique S to Swaziland and E South Africa (S to Eastern Cape).



**Descriptive notes.** 15–16 cm; 17.2–26 g. Large black tit with white in wing. Male nominate race has entire body black (in fresh plumage, crown to uppertail-coverts glossed bluish), tail black, all feathers glossed bluish on fringes and with narrow whitish tips, outermost rectrix broadly fringed and tipped white; lesser upperwing-coverts sooty brown, tips of longer lesser coverts white, median coverts white, greater coverts with dark centres and white fringes, alula and primary coverts black, finely fringed or tipped white; flight-feathers sooty brown, lower tertial broadly fringed white, secondaries narrowly fringed white, primaries the

same or white fringes narrower; side of throat and breast slightly glossed, belly and flanks paler or tipped grey-brown, undertail-coverts broadly tipped white; axillaries sooty black, underwing-coverts black with white tips; in worn plumage duller, white tips on tail abraded, darker centres of greater coverts more extensive, white on tertials also abraded or absent; iris brown; bill black; legs dark slate-grey to blue-grey or grey. Differs from *P. carpi* in slightly larger size, longer tail, less white in wing, slightly greyer underparts, prominently barred undertail-coverts, more white on tips of tail and edge of outermost rectrix. Female is very like male, but less glossy on upperparts, paler or greyer below, breast and belly ash-grey, slightly darker on side of breast, undertail-coverts grey with broad white tips. Juvenile is similar to adult, but dark brown above, tail finely fringed paler brown and outermost rectrix broadly fringed and tipped white, wing feathers darker brown with fringes dull off-white or yellowish, underparts dull greyish-brown, becoming paler on lower belly, undertail-coverts dingy brown with off-white tips. Racial variation slight: *ravidus* is as nominate, but white edges on wings broader and more extensive, forming complete panel on inner greater coverts, greyish wash on flanks more extensive, female has slightly paler or bluish-grey underparts; *xanthostomus* is also as nominate, but both sexes have slightly paler underparts (but darker than previous), especially breast side, flanks and undertail-coverts. **Voice.** Fairly noisy (especially when predator in vicinity), and group-members frequently give nasal, buzzing contact notes, “jee-jee-jee-jee-jee”, “tsi-tsi-chacha” or “tit-si-chachacha”, also a grating “jrr-jrr-jrr...” and harsher “chrrr-chrrr-chrrr”; other calls include high-pitched “chew-ri, chew-ri, chew-ri” and softer or more mellow “peeoo-pu-peeoo” or “cheru-cheru-cheru” and musical “phee-cher, phee-cher”. Song a combination of various call notes repeated in short series, “chip-we, chip-we, chip-we, pi-cher, pi-cher, pi-cher, tiroo, tiroo, tiroo, peetit-woo, peetit-woo, peetit-woo, pee-wirrit, pee-wirrit, pee-wirrit...”, occasionally interspersed with harsher grating or churring notes.

**Habitat.** Wide variety of broadleaf mopane (*Colophospermum*) and miombo (*Brachystegia*) woodland and savanna woodland, including dry woodland and thickets of *Baikiaea*, *Combretum* and *Burkea*, mopane and mixed deciduous woodland, dry miombo and acacia (*Acacia*) thorn-scrub; occurs also in parks and suburban gardens; largely replaced by *P. rufiventris* in brachystegia woodland in areas where the two overlap in range. Usually below 1070 m.

**Food and Feeding.** Diet during breeding principally lepidopteran larvae (including those with toxic hairs); in non-breeding season also other small invertebrates, including beetles (Coleoptera), earthworms (Oligochaeta), moths (Lepidoptera) and spiders (Araneae), also seeds and some fruit, including figs (*Ficus*) and mistletoe (Loranthaceae) berries; also drinks nectar of aloes (particularly *Aloe barberae* and *Aloe ferax*). Usually in pairs or in small groups (probably family parties); in non-breeding season in mixed-species flocks, which roam widely, up to 10 km per day, in search of food. Forages in upper and middle levels of trees, examining foliage (particularly partly eaten leaves for signs of caterpillars), and searching bark and trunk for prey. Will tear off bark strips or lichen; taps dry seedpods, especially of *Combretum* (apparently able to identify those with chalcid wasp larvae), and noisily discards pieces of the husks. Hawks termites (Isoptera) in flight, returning to perch to eat prey.

**Breeding.** Season Aug–Jan; one brood. Monogamous; estimated c. 66% of population have co-operative breeding system, whereby dominant pair assisted in territory defence and brood-rearing by up to three male helpers, probably young from earlier brood (at study site in N South Africa 58% of nests had helpers). Territory used throughout year, may be shared with at least one other pair, male present within territory for most of year, defends it against interlopers (including helpers, until incubation begins) with excited calling, occasionally leading to chasing and physical aggression. Display involves courtship-feeding of female by dominant male, which also chases helpers from female during pre-laying period. Nest built entirely by female, a small, thick pad or

platform of fine plant fibres, lichens and animal hair, placed 2–5 m above ground in natural hole or cavity in tree trunk, occasionally (less frequently than with other tits in region) old hole of woodpecker (Picidae) or barbet (Capitonidae) utilized, or hole in fence post or nestbox used; size of territory depends on numbers of pairs present, 25–30 ha for single pair and 36–48 ha for up to four adults. Clutch 4–5 eggs; incubation by female, fed by male and any helpers present, period 14–15 days; chicks fed by both sexes and by helpers, nestling period up to 24 days; young able to feed themselves after a further 7 days, but also fed by adult female and helpers for up to 40 days; young remain within group’s territory for up to 9 months, before dispersing. Nests occasionally parasitized by Greater Honeyguide (*Indicator indicator*). At study site in South Africa, 13 breeding groups (comprising 13 females and 22 males) successfully fledged 16 young; pairs with helpers generally more successful than those without. Breeds in first year. Of 13 females and 22 males in breeding groups at South African study site, three females and five males survived to following breeding season.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common or locally common. Population in South Africa estimated at 10,000,000 individuals and in S Mozambique estimated c. 500,000 individuals; density of 45 individuals in 400 ha in South Africa (N Limpopo Province).

**Bibliography.** Clancey (1972b, 1996b), Dowsett & Dowsett-Lemaire (1993), Dowsett-Lemaire & Dowsett (2006), Fry *et al.* (2000), Gill *et al.* (2005), Ginn *et al.* (1989), Hall & Moreau (1970), Harrap & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Irwin (1981), Mackworth-Præd & Grant (1963), Maclean (1993), McCarthy (2006), Newman (1989), Penry (1994), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Tarboton (1981).

### 31. Carp’s Black Tit

#### *Parus carpi*

French: Mésange de Carp

German: Carpmoise

Spanish: Carbonero de Carp

Other common names: Carp’s Tit

**Taxonomy.** *Parus niger carpi* Macdonald and B. P. Hall, 1957, Warmquelle, Kaokoveld, Namibia. Forms a superspecies with *P. guineensis*, *P. leucomelas*, *P. niger* and *P. albiventris*, possibly also including *P. leuconotus*. Has been considered conspecific with *P. leucomelas* and *P. niger*; further research required. Monotypic.

**Distribution.** SW Angola and N & W Namibia.



**Descriptive notes.** 15 cm; 17.2–20.3 g. Large, black tit with extensive areas of white in wing. Male has entire body black (in fresh plumage, crown to uppertail-coverts glossed bluish), tail black, all feathers glossed bluish-black on fringes and outer three feathers narrowly tipped white; upperwing-coverts black, lesser and median coverts tipped white (forming solid panel), greater coverts fringed (or more broadly tipped) white except for inners, which are mostly white; alula and primary coverts black, finely fringed or tipped white, flight-feathers blackish-brown, fringes of upper tertials glossy bluish, white on lowest tertial, secondaries

broadly fringed and tipped white (forming broad white panel on closed wing), primaries narrowly fringed white or whitish; slightly glossed on neck side to belly, less visibly so on flanks, undertail-coverts narrowly fringed whitish (appear uniform blackish in field); axillaries and underwing-coverts black, tipped white; in worn plumage, duller (less glossy) overall, white in wing duller and abraded, revealing darker centres of greater coverts; iris dark brown or brown; bill black, paler edges; legs grey, bluish-grey or black. Distinguished from *P. niger* mainly by slightly smaller size, shorter tail and smaller bill, generally more intensely black colour, especially on underparts, less white on tips and side of tail, broader white fringes on inner greater and all median wing-coverts; from *P. leucomelas* by less solid white patch in wing, black centres of outer greater coverts. Female is very like male, but duller or browner on face to throat, and fringes of greater coverts and flight-feathers slightly narrower. Juvenile is as adult, but blackish-brown above, slightly glossed blue on crown, mantle, scapulars and breast (less so on female), wing and tail browner, white on flight-feathers replaced by buffish-yellow, tail feathers lack white at tips. **Voice.** Calls include grating “jer-jer-jer-jer...” as contact (also as “tsi-tsi-tsi-jer-jer-jer...”), also a fairly musical “churia-churia-churia” and a whistled “piu-piu-piu-piu-piu...”, “wich-a, wich-a, wich-a...” and harsher or rasping “tsi-ysi, tsi-cha-cha-cha-cha”. All calls very similar to those of *P. niger*.

**Habitat.** Savanna and acacia (*Acacia*) woodland and dry mopane thickets and woodland, usually with scrubby undergrowth, generally along watercourses in broken or hilly areas; near coast in SW Angola occurs in tangled thickets in dense grassland. Occasional visitor in suburban gardens in non-breeding season. Normally found above 1000 m in Namibia, and at c. 1220–1830 m in S Angola.

**Food and Feeding.** Food not well studied, but known to include small invertebrates, principally spiders (Araneae), ants (Hymenoptera) and termites (Isoptera), also moth larvae (Lepidoptera). Usually in pairs, occasionally solitary; in non-breeding season in small groups of up to six individuals, also joins mixed-species foraging flocks. Active and acrobatic. Forages in large to medium-sized thorn trees and smaller bushes, where it searches foliage and branches for prey; noisily pecks or hammers at seedpods. Fairly restless, and moves quickly from tree to tree in undulating flight.

**Breeding.** Season Oct–May, also Jul, timing influenced by onset of rains and may not breed in drought years; one brood. Monogamous; helpers (usually males) feeding young reported at some nests. Territory usually (not always) occupied throughout year. Male courtship-feeds female, during which both partners quiver wings. Nest built entirely by female, an untidy thick cup or pad of soft plant down, grasses, strips of discarded snakeskin, animal hair and feathers, placed in natural hole or cavity in tree, occasionally in old hole of woodpecker (Picidae) or barbet (Capitonidae), or open pipe or nestbox used. Clutch 4–5 eggs; incubation by female, fed at nest by male, period 13–15 days; chicks leave nest at c. 18 days, fed by parents for at least the following 3–4 days. Breeding success largely dependent on rainfall: in Namibian study of 14 nests, 5 failed owing to desertion during hot, dry weather, and 9 produced at least 1 fledgling each, although 4 of these suffered some predation of nestlings.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Considered to be uncommon or locally common. Global population estimated at between 409,580 and 577,520 individuals.

**Bibliography.** Boix-Hinzen *et al.* (2002), Clancey (1972b, 1995), Fry *et al.* (2000), Ginn *et al.* (1989), Hall (1960), Harrap & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Jarvis & Robertson (1999), Mackworth-Præd & Grant (1963), Maclean (1993), Osborne (2001), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Wiggins (2001).



# Family PARIDAE (TITS AND CHICKADEES)

## SPECIES ACCOUNTS

### 32. White-bellied Tit

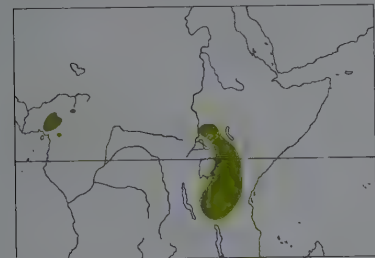
#### *Parus albiventris*

**French:** Mésange à ventre blanc **German:** Weißbauchmeise **Spanish:** Carbonero Ventri blanco  
**Other common names:** White-breasted Tit

**Taxonomy.** *Parus albiventris* Shelley, 1881, Ugogo, northern Tanzania.

Forms a superspecies with *P. guineensis*, *P. leucomelas*, *P. niger* and *P. carpi*, possibly also including *P. leuconotus*. Monotypic.

**Distribution.** SE Nigeria and C & W Cameroon; also SE Sudan, NE Uganda, W Kenya and Tanzania.



**Descriptive notes.** 14–15 cm. Large, black tit with white belly and much white in wing. Male has entire head and upperparts, including tail, black, in fresh plumage glossed bluish; tail narrowly tipped white, and outer feathers fringed white (broadest or most white on outermost); lesser upwing-coverts black, tips of longest ones white, median coverts white, greater coverts black, broadly fringed white, alula black, finely fringed white; flight-feathers black, fringes of lower tertial white (may also be white on central tertial), secondaries narrowly fringed white, becoming more broadly fringed on inners (forming broken

white panel on closed wing), primaries also narrowly fringed white or whitish; chin to centre of breast black (black sometimes extending to upper flanks), slightly glossed blue, sharply demarcated from white rest of underparts; axillaries black, underwing-coverts white; in worn plumage, duller or browner on head and breast, and white in wing and tail abraded, revealing darker centres of feathers; iris dark brown or black; bill black; legs bluish-grey or black. Female is duller than male, sooty black or browner, less glossy, and underparts duller or greyer. Juvenile is as female, but sooty brown above, wings and tail sooty black, white on wing-coverts buff or washed yellowish, no white tips on tail, and throat may be slightly paler. **Voice.** Calls include harsh, nasal “si-chah-chah-chah”, often given with emphasis in scolding alarm, also a similar but thinner or more musical “tss-tss-tss, cher-cher-cher-cher”; contact calls include “twach-twach-twach” or “chrip-twisch-twach”, and also gives sharp “tss, tsee” phrases, often in longer series e.g. “tss, tss, tss, tsee”. Song, apparently infrequently heard, “chee-er-weeoo, chee-er-weeoo”, and a soft and repeated, warbling “pee-pee-purr”.

**Habitat.** In E Africa occurs in lightly bushed acacia (*Acacia*) woodland, edges of montane evergreen forest, riverine woodlands, grassland with scattered trees, orchards, edges of cultivation and large gardens, mostly above 1000 m and up to 3400 m; above 1600 m in SE Sudan. In Nigeria and Cameroon, found in highland savanna at 1070–2135 m.

**Food and Feeding.** Food not well known, but includes small invertebrates, e.g. spiders (Araneae), grasshoppers (Orthoptera) and larvae, also seeds, and possibly nectar. Solitary, in pairs or often in fairly large flocks; often one of the main components in mixed-species foraging flocks. Active and restless, with rapid flitting motion. Forages usually in canopy and middle levels of trees, also frequently descending to lower branches and undergrowth; investigates foliage, branches (including undersides), bark, clumps of lichens, and epiphytes in great detail.

**Breeding.** Poorly known. Probably breeds throughout year, but mainly during rains in Oct–Jan. Monogamous; territorial. Nest a small cup or pad, mostly of bark strips, lichen, animal hair, plant down and fibres, placed up to 8 m from ground in natural hole or cavity in decaying tree stump or behind loose bark, or may utilize old hole of woodpecker (Picidae) or barbet (Capitonidae); entrance to nest-hole usually a very narrow slit. Clutch 3–5 eggs; incubation period at least 12 days; young fledge at least 20 days after hatching.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common or locally common; rare in SE Nigeria, where confined to Obudu Plateau. Some evidence of reduction in range in Kenya, where thought to have occurred formerly along E coastal strip, parts of Tsavo East National Park and several arid areas in SE.

**Bibliography.** Borrow & Demey (2001), Britton (1980), Carswell *et al.* (2005), Elgood *et al.* (1994), Fry *et al.* (2000), Gill *et al.* (2005), Hall & Moreau (1970), Harrap (1996), Harrap & Quinn (1996), Lewis & Pomeroy (1989), Mackworth-Præd & Grant (1973), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

### 33. White-backed Black Tit

#### *Parus leuconotus*

**French:** Mésange à dos blanc **German:** Weißrückenmeise **Spanish:** Carbonero Dorsiblanco  
**Other common names:** White-backed Tit

**Taxonomy.** *Parus leuconotus* Guérin-Méneville, 1843, Ethiopia.

Apparently closely related to, and possibly a member of, the superspecies formed by *P. guineensis*, *P. leucomelas*, *P. niger*, *P. carpi* and *P. albiventris*. Monotypic.

**Distribution.** Eritrea and Ethiopia.



**Descriptive notes.** 13.5–14 cm; 16–17 g. Medium-sized to large, small-billed black tit with creamy-white patch on upperparts. Male in fresh plumage has entire body, wing and tail sooty black, except for creamy-white mantle to upper back; crown to nape glossed deep blue, rest of upperparts, including wing, faintly glossed, tail feathers glossed bluish-black on fringes, fine narrow whitish tips on outermost three pairs; usually narrow white tips on tertials and secondaries, and white tips on undertail-coverts; in worn plumage, duller or browner, mantle patch greyer and occasionally smaller (restricted to side of mantle); iris brown; bill black; legs

dark slate-grey to black. Female has underparts duller or more sooty brown than male. Juvenile is slightly duller and browner than adult, lacking gloss, and mantle patch is duller or more buffish and may show darker feathers bases. **Voice.** Calls include buzzing “bee-bzz-bzz”, dry “tchu-chu-chu” like that of a sparrow (*Passer*), also often as single “tchu” note, also a thin “tsit”, and a liquid “plit”

or “quit” which may be run into longer series as “plit, tchiu-pdu, plit, tchiu-pdu...” or “pit-tyo-wheel...”; also variety of more typical tit-like phrases, including harsh “tzet-tzee-tzee, tzet-tzee-tzee-tzet” and more rapid “tsi-za-za-za”. Song a longer version of call-note phrases, often given with emphasis, e.g. “tchu, plit-kli, chu-eeu, tchu, plit-kli chu-ee-u” and “tit-teet-toraykeet, jit-jit”. **Habitat.** Principally in highland *Hagenia* forests, also mixed podocarp–juniper–olive (*Podocarpus–Juniperus–Olea*) forest at 1800–3200 m; also highland bamboo and giant heath at higher altitudes, to 3500 m. Has been recorded down to 1370 m near Jima, in SC Ethiopia.

**Food and Feeding.** Diet not well known, but includes small invertebrates, larvae and seeds. Solitary or in pairs; also in small loose groups. Actively forages in middle to upper levels of trees.

**Breeding.** Thought to breed in Jan, May and Aug, and female in breeding condition Dec, but no nests found. No other information. Maximum recorded longevity 8 years.

**Movements.** Primarily resident; some altitudinal movement. One ringed individual recovered 223 km from site where ringed.

**Status and Conservation.** Not globally threatened. Common or locally common in Ethiopia. In Eritrea was formerly uncommon, and possibly now extirpated; not seen since 1957. Present in Bale Mountains National Park (Ethiopia).

**Bibliography.** Ash (1994), Ash & Gullick (1989), Fry *et al.* (2000), Hall & Moreau (1970), Harrap (1996), Harrap & Quinn (1996), Mackworth-Præd & Grant (1973), Neumann (1906), Pol (2001), Rüppell (1845), Sinclair & Ryan (2003), Urban & Brown (1971).

### 34. Dusky Tit

#### *Parus funereus*

**French:** Mésange enfumée **German:** Einfarbmeise **Spanish:** Carbonero Cenizo

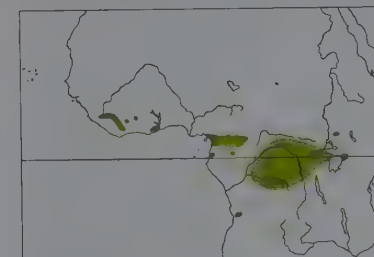
**Taxonomy.** *Melanoparus funereus* J. Verreaux and É. Verreaux, 1855, Gabon.

Has been considered part of the superspecies formed by *P. guineensis*, *P. leucomelas*, *P. niger*, *P. carpi* and *P. albiventris*, possibly also *P. leuconotus*, but is ecologically separated from all of these and all other African tits. Two subspecies recognized.

**Subspecies and Distribution.**

*P. f. funereus* (J. Verreaux & É. Verreaux, 1855) – Sierra Leone and Guinea E, discontinuously, to DR Congo, S Uganda, extreme S Sudan and W Kenya.

*P. f. gabela* T aylor, 1961 – W Angola.



**Descriptive notes.** 13–14.5 cm; 22–29 g. Medium-sized to large, all-dark tit with red eyes. Male nominate race has entire body, wing and tail blackish or sooty black, in fresh plumage crown to uppertail-coverts glossed bluish-green; upperwing-coverts glossed duller bluish-green, and flight-feathers slightly darker, outer primaries finely fringed greyish; axillaries blackish to dark-grey; in worn plumage, flight-feathers duller and browner; iris deep bright red to orange-red; bill black; legs bluish-grey or black. Female is similar to male, but has upperparts blackish-grey, brownish-grey feather tips on forehead to nape, upperparts duller and less

glossy than male, tail fringed grey-brown, greater coverts and flight-feathers also finely fringed greyer, face and underparts paler and greyer than male. Juvenile resembles male, with upperparts blackish-brown but lacking glossy tones, and with large white tips on greater coverts. Race *gabela* differs little from nominate, has throat to breast duller black, lacking greenish gloss, and female is paler, with underparts bluish slate-grey. **Voice.** Very vocal, and has wide variety of calls, including slow and ringing “see-er, see-er, see-er”, variably given as “ss-pyew” or “fui-tsiu” (Rwanda) or “see-tyop” (Liberia), also a metallic “chut-chut-tzi-tzi-tzi” and similar whistled “tsi-tsi-tsi-tu”, and a series of slow, harsh churrs, “tirru, tirru, tirru, turee, tirru”. Song apparently a longer and more varied version of the call notes, including slow, metallic and ringing “tsi-piu, tsi-piu, tsi-piu” or “tsi-pupu, tsi-piu, tsi-pupu, tsitsi-pu” and repeated “zi-zizi-huititi-tihui-tihui”, also described as a jumbled medley of harsh and whistled notes incorporating various call notes and churrs, together with occasional imitations of other birds, e.g. Fraser’s Forest-flycatcher (*Fraseria ocreata*).

**Habitat.** Dense primary and secondary evergreen forests, also gallery forest, old plantations and edges of cultivation; in Liberia occurs in forest–grassland mosaic at 550–800 m on Mt Nimba. Above 800 m in Guinea and to 2200 m in DR Congo; up to 2000 m in S Sudan (Imatong Mts), at 900–1700 m in Uganda and W Kenya, but to 2440 m in Impenetrable Forest (SW Uganda); to 2500 m (but more numerous below 2100 m) in Nyungwe Forest, in Rwanda; to 2500 m in W Angola.

**Food and Feeding.** Food includes small invertebrates, mainly beetles (Coleoptera) and orthopterans, also larvae, principally of micro-lepidopterans; also seeds and fruit. Usually in pairs, in family parties of 3–6 individuals, or in larger groups of up to 15; also often in (or leading) mixed-species foraging flocks. Single-species flocks occupy and defend territories of 12–15 ha. Actively forages in canopy, on boughs and around branches of tall trees, also clings to trunk, including of tall parasol trees (*Musanga*) in secondary forest; rarely descends to within 15 m of ground. Examines branches, clumps of dead leaves and bark for prey, occasionally in fruiting trees e.g. fig (*Ficus*).

**Breeding.** Poorly known. Season variable, possibly dependent on rains; adults in breeding condition in Nov in W Africa and Mar, Jun and Sept in DR Congo, and fledglings in Apr–Jul and Oct in W Africa and Oct in Uganda. One nest found, lined with soft plant material, placed 15 m from ground in hole in dead tree. Clutch 3 eggs; two juveniles begging for food 3 months after leaving nest. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Locally common or uncommon in Guinea, Sudan and Uganda; scarce in Sierra Leone and Cameroon; rare in E Ivory Coast and S Ghana. Estimated density of 25–30 individuals/km<sup>2</sup> in NE Gabon. In Uganda, range formerly extended E to Mt Elgon. Entire population of W Angolan race *gabela* now confined to small area of evergreen forest, most of which has been replaced with coffee plantations.

**Bibliography.** Borrow & Demey (2001), Britton (1980), Brosset & Éard (1986), Carswell *et al.* (2005), Chapin (1954), Colston & Curry-Lindahl (1986), Dowsett-Lemaire & Dowsett (1998), Fry *et al.* (2000), Gatter (1997), Gill *et al.* (2005), Hall & Moreau (1970), Harrap & Quinn (1996), Lewis & Pomeroy (1989), Mackworth-Præd & Grant (1973), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

### 35. Rufous-bellied Tit

#### *Parus rufiventris*

**French:** Mésange à ventre cannelle **German:** Rostbauchmeise **Spanish:** Carbonero Ventrirrufo



Other common names: Rufous Tit

**Taxonomy.** *Parus rufiventris* Bocage, 1877, Caconda, Angola.

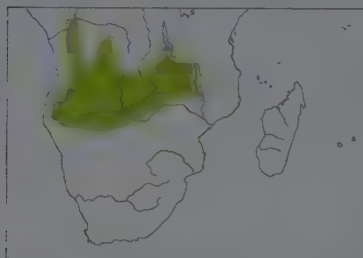
Forms a superspecies with *P. pallidiventris* and *P. fringillinus*. Has been considered conspecific with former, but differs in eye colour (possibly age-related) and belly colour (varies clinally); hybridization not proven, and identity of supposed intermediates (based chiefly on eye coloration) uncertain; further research required. Races intergrade widely. Three subspecies recognized.

**Subspecies and Distribution.**

*P. r. rufiventris* Bocage, 1877 – S PR Congo and SW & S DR Congo S to C Angola and C Zambia.

*P. r. diligens* Clancey, 1979 – S Angola, N Namibia, SW Zambia and NW Botswana.

*P. r. masukuensis* Shelley, 1900 – SE DR Congo, E Zambia and Malawi.



**Descriptive notes.** 14–15 cm; c. 20 g. Large tit with pale eye, black head to breast and rufous underparts. Male nominate race has entire head to nape and neck side, throat and breast black, in fresh plumage glossed bluish; mantle, back and scapulars dark grey, rump and uppertail-coverts darker (blackish-grey); tail black, outer two feathers narrowly tipped white; upperwing-coverts black, broadly fringed and tipped white (narrowly edged on greater), alula black, primary coverts dark grey, finely fringed pale greyish and tipped white; flight-feathers black, all tertials broadly fringed and tipped whitish, secondaries and primaries finely fringed whitish; side of breast to centre of lower breast dark grey, rest of underparts dull rufous-orange; axillaries pale grey, underwing-coverts white; in worn plumage, pale fringes on wing become abraded and duller; iris sulphur-yellow or creamy; bill black; legs bluish-grey. Female is very like male, but has slightly paler rufous underparts. Juvenile is as adult but duller, with head to upper breast dark sooty grey, crown greyish, upperparts tinged brown, wings dark sooty brown, median and greater upperwing-coverts with buffish tips, edges of greater coverts narrower than on adult, flight-feathers fringed yellowish-buff, lower breast, belly and flanks pale chestnut, iris darker or greyer. Racial variation slight: *diligens* is as nominate, but head duller and grades into more blue-grey mantle, chin to throat less black and grading into grey on breast, female has duller hood merging with same colour on mantle and back, and has chin to upper throat grey; *masukuensis* is also as nominate, but has upperparts paler grey, throat blackish, breast paler grey, underparts paler or pinkish-cinnamon. VOICE. Calls include thin “sit, sit” and “sziit”, becoming part of longer series of “si-ch” or “tsitsi-chaa-chaa-chaa-chaa” or a more rolling “whit-cherr, whit-cherr, whit-cherr”; occasionally a sweeter or higher-pitched and frequently repeated “pet-tipio, pet-tipio, pet-tipio”; alarm a harsh, grating “churr-churr-churr”. Song very like a longer version of call notes, as well as rapid and ringing deliveries of typical tit-like notes, including “weetu-chu, weetu-chu”, “chick-wee, chick-wee, chick-wee”, “peetada, peetada, peetada...” or “pet-tida, pet-tida, pet-tida”.

**Habitat.** Open and mature mopane or miombo (*Brachystegia*) woodland, savanna with thorn-scrub, edges of dry evergreen forest and *Baikiaea* woodland, also mossy transitional woodland. Co-exists with *P. griseiventris* in mature miombo woodland (though the two species apparently occupy differing niches); occurs with *P. niger* in areas of dry woodland in NE Namibia, rarely elsewhere. Usually above 600 m or possibly slightly lower (down to L Nyasa, in Malawi); to 1725 m in DR Congo (most numerous at 1200–1500 m), to 1950 m in NE Zambia, and to c. 2000 m in Malawi (Nyika Plateau).

**Food and Feeding.** Diet principally small invertebrates and larvae. Usually in pairs, small groups or mixed-species flocks; occasionally in foraging flocks with *P. griseiventris*. Forages in middle and upper levels of trees, favouring large trees and those with heavy growth of lichens, especially *Usnea*; forages mostly among outer foliage and branches, where it gleans insect prey from outer leaves while clinging to slender twigs.

**Breeding.** Poorly known. Season Sept–Dec. Possibly a co-operative breeder, group of four individuals prospecting for nest-sites in Angola. Nest a cup or pad of grass and plant fibres, bark strips and animal hair, placed up to 3 m (exceptionally to 8 m) above ground in hole in tree trunk or old tree stump, often in old hole of woodpecker (Picidae) or barbet (Capitonidae). Clutch 3–4 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common or locally fairly common in DR Congo and Zambia; uncommon elsewhere. Rare, or irregular visitor, in NW Botswana. In Zambia, density of 2–1 individuals/10 ha of miombo woodland.

**Bibliography.** Alerstam & Ulfstrand (1977), Britton (1980), Clancey (1996b), Dowsett & Dowsett-Lemaire (1993), Dowsett-Lemaire & Dowsett (2006), Fry *et al.* (2000), Gill *et al.* (2005), Ginn *et al.* (1989), Hall & Moreau (1970), Harrap & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Irwin (1981), Mackworth-Præd & Grant (1963, 1973), Maclean (1993), McCarthy (2006), Newman (1989), Penry (1994), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Stevenson & Fanshawe (2002).

## 36. Cinnamon-breasted Tit

### *Parus pallidiventris*

**French:** Mésange à œil jaunâtre **German:** Zimtbauchmeise **Spanish:** Carbonero Ventripálido

**Taxonomy.** *Parus pallidiventris* Reichenow, 1885, Kakoma, Tabora district, Tanzania.

Forms a superspecies with *P. rufiventris* and *P. fringillinus*. Has been considered conspecific with former, but differs in eye colour (possibly age-related) and belly colour (varies clinally); hybridization not proven, and identity of supposed intermediates (based chiefly on eye coloration) uncertain; further research required. Races intergrade in Mozambique. Two subspecies recognized.

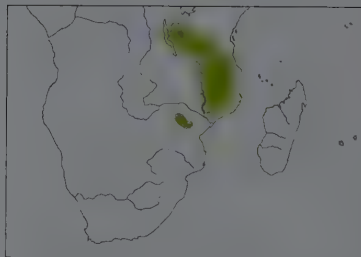
**Subspecies and Distribution.**

*P. p. pallidiventris* Reichenow, 1885 – Tanzania, S Malawi and N Mozambique.

*P. p. stenotopicus* Clancey, 1989 – E Zimbabwe and WC Mozambique.

**Descriptive notes.** 15 cm. Large tit with dark eye, black head to breast and pale pinkish underparts. Male nominate race has entire head to nape and neck side, throat and centre of breast black, in fresh plumage slightly glossed bluish; mantle, back and scapulars dark grey, rump slightly paler grey, blackish shaft streaks on uppertail-coverts; tail black, all feathers narrowly fringed and tipped white; upperwing-coverts black, fringed and more broadly tipped white, alula black, primary coverts blackish, finely fringed and tipped pale greyish; flight-feathers black or blackish-grey, tertials broadly fringed and tipped whitish, secondaries and primaries finely fringed whitish, bases of outer primaries more broadly edged whitish (forming small patch); breast side to centre of lower breast dark grey, rest of underparts pale pinkish-buff, washed greyish; axillaries pale grey, tipped whitish, underwing-coverts white; in worn plumage, fringes of wing-coverts and flight-feathers abraded; iris brown to deep brown; bill black; legs light blue to bluish-grey. Female differs from

## Family PARIDAE (TITS AND CHICKADEES) SPECIES ACCOUNTS



male only in having slightly browner chin to breast. Juvenile has head to breast more sooty brown, or slightly paler brown on throat to upper breast, upperparts tinged brown, tail dark brown, wings dark sooty brown, median and greater coverts with broad off-white tips, edges of greater coverts narrower than on adult, secondaries and primaries fringed dingy yellowish-white, underparts paler and duller than adult, iris darker. Racial variation slight: *stenotopicus* has head duller or browner than nominate, mantle greyer, wing-coverts more broadly fringed and tipped white, white at base of outer primaries more extensive, black on

throat more sharply demarcated from grey of breast, lower breast paler grey, rest of underparts variably reddish to pinkish-buff. Voice. No information; calls and song apparently indistinguishable from those of *P. rufiventris*.

**Habitat.** Miombo (*Brachystegia*) and mahobohobo (*Uapaca*) woodland and wooded savanna, often with scattered thorn-scrub; at 490–670 m in Tanzania, 760–1525 m in Malawi, 275–840 m (but up to 1400 m on Mt Namuli) in Mozambique, and 500–1600 m in E highlands of Zimbabwe.

**Food and Feeding.** Diet not well known, but includes small invertebrates and larvae, also seeds and fruit. Usually in pairs or in groups of 3–4 individuals (possibly two pairs); also joins mixed-species foraging flocks, and in miombo woodland often found in close association with *P. griseiventris*. Forages mostly in upper and canopy levels of trees and scrub.

**Breeding.** Poorly known. Season Sept–Dec. Nest a pad or cup of grasses, plant fibres and bark strips, placed in hole in tree or stump. Clutch 4 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not assessed. Fairly common in N of range; less common or uncommon in Zimbabwe. Possibly present also in E Zambia; further research and fieldwork required.

**Bibliography.** Britton (1980), Dowsett & Dowsett-Lemaire (1993), Friedmann & Loveridge (1937), Fry *et al.* (2000), Hall & Moreau (1970), Harrap & Quinn (1996), Irwin (1981), Mackworth-Præd & Grant (1973), McCarthy (2006), Short *et al.* (1990), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

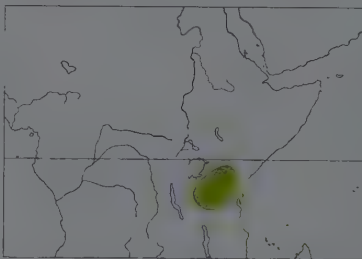
## 37. Red-throated Tit

### *Parus fringillinus*

**French:** Mésange à gorge rousse **German:** Rostkehlmeise **Spanish:** Carbonero Gorjirrufo

**Taxonomy.** *Parus fringillinus* G. A. Fischer and Reichenow, 1884, Mount Meru, Arusha, Tanzania. Forms a superspecies with *P. rufiventris* and *P. pallidiventris*. Monotypic.

**Distribution.** S Kenya and N & C Tanzania.



**Descriptive notes.** 11.5–12 cm. Small to medium-sized grey tit with rufous face, dark cap and white in wings. Male has bright rufous (sometimes tinged buffish) from forehead narrowly over eye to face, hindneck, neck side and chin to breast, dark grey or blackish crown to nape (may be finely fringed paler or greyer in fresh plumage); upperparts medium to dark grey; tail black, all feathers narrowly tipped white, outer two with white outer edge; upperwing-coverts dark greyish to black, broadly tipped white on medians and fringed and tipped white on greater, alula and primary coverts finely fringed pale greyish to off-white;

flight-feathers blackish-grey, tertials broadly fringed and tipped white, secondaries and primaries narrowly fringed white; side of breast to belly and vent buffish-grey, flanks and undertail-coverts slightly greyer, the latter tipped broadly whitish; axillaries and underwing-coverts pale grey; in worn plumage, cap darker, fringes and tips of wing feathers narrower; iris brown to deep brown; bill blue-grey to blackish, dark tip of upper mandible; legs bluish-grey to black. Female is as male, but has slightly paler rufous-buff forehead and face to breast. Juvenile is as female, but cap greyer and less well defined, with broad cinnamon or buffish edges, less white in tail. VOICE. Calls include variable “chick” or “pick”, variably plaintive, squeaky or explosive, also a softer but longer series of same note as “chick-chick, chick-chick-chick, chick-chick-chick...”, also “chachawi-chachawi-chachawi” and a typical parid “prtt-tchay-tchay-tchay” recalling similar notes of *Poecile montanus*; also a drawn-out series of “see-er” notes and a more buzzing “bzee-zee-zee”, and a harsh or scolding “ch-ch-ch” or longer “chrrrr”, which may be given with a thinner “si”, “tsi” or “sit” or a harsh “zwi-zwi-zwi”.

**Habitat.** Open acacia (*Acacia*) woodland, principally *Acacia xanthophloea*, and bushy and partly wooded savanna, also riverine woodland; usually at 1000–1600 m, exceptionally to 2000 m.

**Food and Feeding.** Food items include small invertebrates and larvae, also seeds and fruit. Occurs singly, in pairs or in small groups. Conspicuous and often very vocal, with frequent contact calls. Forages in all levels of trees and shrubs, moving slowly through foliage and vegetation, inspecting the foliage and bark.

**Breeding.** Poorly known. Season unclear, breeding recorded in Jan, Feb, Apr and Aug–Sept; may breed throughout year, with main frequency determined by rainy season. Only a single nest found, mostly of soft plant down and fibres, placed in cavity behind loose bark of tree; contained 3 eggs. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Uncommon or locally common. Fairly common in Masai Mara, in S Kenya; fairly common also in Serengeti and Arusha National Parks, in N Tanzania.

**Bibliography.** Britton (1980), Collar *et al.* (1994), Friedmann & Loveridge (1937), Fry *et al.* (2000), Harrap & Quinn (1996), Lewis & Pomeroy (1989), Mackworth-Præd & Grant (1973), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

## 38. Stripe-breasted Tit

### *Parus fasciiventer*

**French:** Mésange à ventre strié

**German:** Schwarzbrustmeise

**Spanish:** Carbonero del Ruwenzori



**Taxonomy.** *Parus fasciiventer* Reichenow, 1893, Ruwenzori Mountains, on DR Congo–Uganda border.

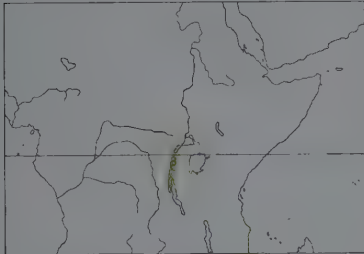
Has been considered part of the *P. afer* superspecies; probably closest to that group, but distinct morphologically and in habitat preferences. Nominate race and *tanganjicae* intergrade in SW Rwanda. Three subspecies recognized.

**Subspecies and Distribution.**

*P. f. fasciiventer* Reichenow, 1893 – Ruwenzori Mts (E DR Congo and W Uganda) and S in mountains to W Rwanda, highlands W of L Kivu and W Burundi.

*P. f. tanganjicae* Reichenow, 1909 – Itombwe Mts, in SE Kivu (E DR Congo) and SW Rwanda (Nyungwe forest).

*P. f. kaboboensis* Prigogine, 1957 – Mt Kabobo, in extreme SE Kivu (E DR Congo).



**Descriptive notes.** 14 cm; 14–15 g. Large tit with black head, and black stripe on white belly. Male nominate race has entire head to nape, neck side, throat and breast black, this colour tapering onto centre of upper belly (in fresh plumage, faintly glossed bluish on crown, nape, throat and breast); upperparts grey, washed brown, tips of longest uppertail-coverts blackish; tail black, narrowly tipped white (white may be lacking on central pair), outermost feather broadly edged white; upperwing-coverts black, fringed and more broadly tipped white, alula black, narrowly fringed whitish; flight-feathers black or blackish-grey, tertials

broadly fringed and tipped whitish, secondaries and primaries finely fringed whitish, bases of outer primaries more broadly edged whitish (forming small patch); side of lower breast to flanks and undertail-coverts white, duller or brownish on flanks; axillaries and underwing-coverts white; iris reddish-brown to deep brown; bill black; legs bluish-grey to slate-grey or greenish. Female has slightly browner head to breast and upper belly than male. Juvenile is as adult, but head to breast more sooty brown or duller brown (with blackish feather bases on throat, neck side and upper breast), narrow blackish stripe on centre of upper belly, rest of underparts tinged buffish or yellowish, upperparts tinged browner, less white at tips of tail, also tips of median and greater coverts yellowish-buff, edges of secondaries and primaries dingy yellowish-white. Race *tanganjicae* is as nominate female, but male has head to breast browner, with more obvious small black cap, blackish-grey on centre of throat down to belly stripe, rest of underparts more heavily washed buffish; *kaboboensis* has head and breast to centre of belly as nominate (female has paler brown breast), but upperparts more visibly washed bluish-grey, and rest of underparts darker grey except for whiter undertail-coverts. VOICE. Calls include soft “whit” or “whip” contact note and sharp or more strident “chit” or “tit”, also lower-pitched “dzer” or grating “grrr” or trilling “tittitrrrrrrr” that may be included in longer sequence e.g. “tittit-grr-ti-grr”, or with ringing “pseet” into longer series as e.g. “chit-chit-char-char, pseet char-char, chi-chit-char, chit-chit-char-char...”, or “chur-chur-chur-chur”; also gives thin “chit-lilit”; in alarm a short “chrit” note, often extended into longer scolding “chrit-it-it-it-it-it...” and may be combined in distinctive frog-like “chrit-chit-chit crud-y crud-y chrit-it-it-it-it-it!”. Song a repeated “tea-cher” phrase, like that of *P. major*.

**Habitat.** Montane forests, including *Hagenia* woodland, with bamboo and well-developed undergrowth; also tree-heath and gallery forest. Highlands and mountains; in Uganda at 1800–3400 m, and SW Rwanda widespread above 2300 m in Nyungwe Forest.

**Food and Feeding.** Diet poorly known, but presumably includes small invertebrates and larvae; nestlings fed mainly with caterpillars. Usually in small to medium-sized groups of presumed family parties; occasionally in mixed-species foraging flocks with *P. funereus* and white-eyes (*Zosterops*). Fairly tame and approachable. Forages usually in upper or canopy level, also visiting smaller trees along forest edge and in clearings; may descend to lower levels of trees, but rarely in forest undergrowth. Feeds in busy probing fashion among foliage, including dead leaves and branches suspended in canopy, and creepers; also probes bark.

**Breeding.** Not well known. Season possibly Feb–Jul; birds in breeding condition in Nov in DR Congo and Dec–Jan in Uganda, nestling in Dec in Uganda, and family parties containing both dependent and independent juveniles in Oct in Rwanda, the latter indicating possibility of two broods. Monogamous; possibly a co-operative breeder, as additional birds seen to attend nestbox where pair nesting. Territorial. Only three nests documented, mostly of dry *Usnea* lichens and strips of discarded snakeskin, all in nestboxes. Clutch 3 eggs; nestlings brooded by female and fed mostly by male. No other information.

**Movements.** Resident, endemic to the Albertine Rift mountains.

**Status and Conservation.** Not globally threatened. Restricted-range species: present in Albertine Rift Mountains EBA. Common to locally very common. Although it is not presently at risk, any large-scale destruction or diminution of the forests within this species’ small range would possibly create a long-term threat to its survival.

**Bibliography.** Alerstam & Ulfstrand (1977), Britton (1980), Carswell *et al.* (2005), Dehn & Christiansen (2001), Fry *et al.* (2000), Gill *et al.* (2005), Hall & Moreau (1970), Harrap & Quinn (1996), Mackworth-Præd & Grant (1973), Shaw (2001b), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002).

## 39. Somali Tit

### *Parus thruppi*

**French:** Mésange somalienne **German:** Somalimeise **Spanish:** Carbonero Somali  
**Other common names:** Acaia Tit, Northern Grey Tit

**Taxonomy.** *Parus thruppi* Shelley, 1885, south of Burao, north-west Somalia.

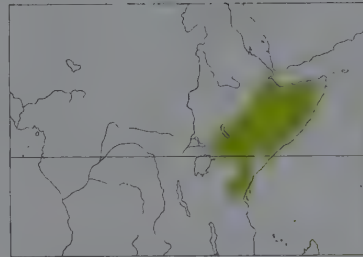
Forms a superspecies with *P. griseiventris*, *P. cinerascens* and *P. afer*. Has been considered conspecific with either one or both of last two, but differs morphologically, and is separated geographically from both by *P. griseiventris*. Nominate race intergrades with *harakae* in N Kenya. Two subspecies recognized.

**Subspecies and Distribution.**

*P. t. thruppi* Shelley, 1885 – S & E Ethiopia, Somalia (except SW) and N Kenya.

*P. t. barakae* F. J. Jackson, 1899 – extreme E Uganda, Kenya, SW Somalia (Gedo) and NE Tanzania.

**Descriptive notes.** 11.5–12 cm; 12 g. Small grey tit with large white face patch and black cap, bib and ventral stripe. Male nominate race has forehead and upper lores blackish, tipped buffish, crown and crown side (to below eye), nape and side of neck black, in fresh plumage slightly glossed bluish, small off-white patch on lower nape; upperparts grey, washed slightly buffish, longest uppertail-coverts tipped blackish; tail black, all feathers except central pair narrowly tipped white, broadest on outermost; upperwing-coverts sooty black, fringed and more broadly tipped white,



alula and primary coverts black, finely fringed and tipped whitish; flight-feathers black, tertials fringed whitish on outer edge, secondaries and primaries finely fringed whitish; cheek and ear-coverts white; chin, throat and centre of upper breast black, continuing as narrow black line to vent (may show irregular white tips on throat, upper breast and ventral line), narrow white border to black on breast and upper belly; sides of lower breast and belly pale buffish (sometimes tinged pinkish) to greyish, undertail-coverts fringed whitish; axillaries pale grey, underwing-coverts off-white; in worn plumage, forehead, crown and nape

duller, upperparts duller grey, less white at tips of tail, fringes of wing feathers abraded; iris brown to reddish-brown; bill dark slate or black; legs bluish-grey to black. Differs from very similar *P. griseiventris* in having broad black on sides of neck (enclosing white on face), slightly broader black bib. Female is like male, but slightly duller and less extensive black on chin to breast. Juvenile resembles adult, with lower forehead pale buffish, crown to nape sooty brown, upperparts tinged duller brown, tail darker brown without white at tips, wings dark sooty brown, median and greater coverts with broad off-white tips, edges of greater coverts narrower than on adult, chin to centre of upper breast sooty brown, ventral line usually absent, rest of underparts duller; first-year separable from adult by mixture of old and new wing-coverts and flight-feathers. Race *barakae* is similar to nominate, but upperparts slightly paler, nuchal spot smaller or absent, breast side and border of ventral line broader and whiter, flanks pale grey with faint buff tinge. VOICE. Calls include buzzy “chya chya”, soft but hoarse “chet” or “chut”, often as longer “chet-chet-chet” series, also “tsi-tsa-char” and an explosive “tsi-tsi-chay-chay-chay” or “tsi-tsi-de-de-de-de-de”; also “si-ta-tcharr” and “tsia-tsia, tsia-tsia” with first note slurred or drawn out to a series of “tis-si-si-si”; also a nasal, rasping “chewy chewy chewy” or harsher “tchwa tchwa” and a rambling jumble of notes. Song a pleasant “see-uu” or “tuwee” with emphasis on second syllable, repeated up to six times, and a more typical “twee-tew-tew-tew” or “tsi-tsi-tchuerr-tchuerr-tchuerr”.  
**Habitat.** Mainly dry or arid open acacia (*Acacia*) woodland and *Commiphora* scrub, bushed grassland (but generally avoiding driest areas), also trees along watercourses. To at least 1400 m and possibly to 2000 m in Ethiopia, to 1000 m and locally to 1600 m in NW & C highlands of Kenya, and to 1500 m in Tanzania; in Somalia, up to 1950 m in N but inhabits lowlands in S.

**Food and Feeding.** Diet poorly known, but includes small invertebrates, principally wasps (Hymenoptera), beetles (Coleoptera) and larvae. Usually in pairs or in small to medium-sized groups of presumed family parties; often in mixed-species foraging flocks. Behaviour little known; appears to forage mostly in upper levels of trees, inspecting the bark and branches.

**Breeding.** Very poorly known, and few nests found. Season Feb–Jun. Territorial. Nest placed 2.5–7 m from ground in hole in dead tree. Clutch possibly 2 eggs. No other information.

**Movements.** Resident; vagrant in NE Uganda.

**Status and Conservation.** Not globally threatened. Uncommon to locally common. Poorly known species.

**Bibliography.** Archer & Godman (1961), Ash & Miskell (1998), Britton (1980), Carswell *et al.* (2005), Dowsett & Dowsett-Lemaire (1993), Fry *et al.* (2000), Granvik (1934), Hall & Moreau (1970), Harrap & Quinn (1996), Lewis & Pomeroy (1989), Mackworth-Præd & Grant (1973), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

## 40. Miombo Tit

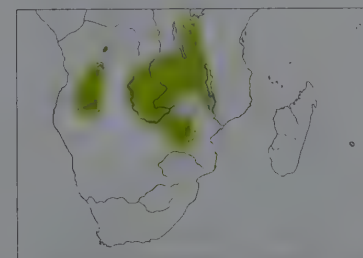
### *Parus griseiventris*

**French:** Mésange à ventre gris **German:** Graubauchmeise **Spanish:** Carbonero del Miombo  
**Other common names:** Miombo Grey/Northern Grey/Tabora Grey Tit

**Taxonomy.** *Parus griseiventris* Reichenow, 1882, Kakama, Tabora District, Tanzania.

Forms a superspecies with *P. thruppi*, *P. cinerascens* and *P. afer*. Has been considered conspecific with *P. cinerascens*. Paler birds from Zambia described as race *lundarum*, and birds from Mozambique and Zimbabwe with more prominent nuchal spot as *parvirostris*; definition and geographical delimitation of these, however, considered unpracticable. Treated as monotypic.

**Distribution.** Angola, S & SE DR Congo, and W Tanzania S to Zambia, Zimbabwe and NW Mozambique.



**Descriptive notes.** 14–15 cm. c. 20 g. Large black, white and grey tit. Male has forehead, crown and crown side (to below eye) and nape black, faintly glossed bluish in fresh plumage, small greyish-white patch on lower nape (sometimes absent), in Zimbabwe and N Mozambique nuchal patch typically more clearly defined (“*parvirostris*”); upperparts grey, longest uppertail-coverts tipped blackish; tail black, all feathers except central pair narrowly tipped pale grey, outer three pairs fringed pale grey, broadest on outer web of outermost; upperwing-coverts black, medians and greater coverts fringed and broadly tipped white, alula and

primary coverts black, finely fringed whitish; flight-feathers black, tertials fringed broadly whitish on outer edge and narrowly on inner edge, secondaries and primaries finely fringed whitish; cheek, ear-coverts and side of neck dull whitish to buffish; chin and throat (including side of throat) sooty black, black continuing as narrow line to centre of belly (may show occasional or irregular white tips on throat, upper breast and ventral line), side of lower breast and belly pale off-white, flanks greyish, undertail-coverts grey with whitish fringes; axillaries pale grey, underwing-coverts off-white; variation includes birds in Zambia with nuchal patch well defined, usually paler grey upperparts, white tips on median coverts broader, and underparts creamy-white with buffish-grey wash on breast side and flanks (“*lundarum*”); in worn plumage, crown and nape duller, upperparts slightly duller or browner, fringes of wing feathers abraded; iris brown to grey-brown or dark brown; bill black; legs greyish to black. Distinguished from very similar *P. thruppi* by larger size, lack of black on neck side (white on face meets that on side of neck); from *P. cinerascens* by smaller bill, duller cap, paler grey plumage, whiter underparts. Female is like male, but has slightly duller (less glossy) crown, and slightly less black and less extensive bib. Juvenile is as female, but outer tail feathers only narrowly fringed and without white at tips, wings dark sooty brown, edges of flight-feathers washed yellowish-buff, cheek duller or more buffish, bib duller sooty brown,



ventral line usually absent. Voice. Most frequent call "chitji", sometimes accompanied by loud "chip", also a harsh or deep "chrrr-chrrr-chrrr-chrrr" often preceded by thin "si", "sisi", "tit" or "plit", occasionally with more squeaky "tit-tieu"; rolling "swip-ji-ji-ji-ji" and chattering or scolding "tjou-tjou-tjou-tjou", also a more prolonged and downslurred "tsirrrrrrr"; calls are very similar to those of both *P. cinerascens* and *P. afer*. Song a typical parid series of whistled phrases, "toowee-toowee, toowee-teeyoo, toowee-teeyoo", "tsi-ttreeooo-tweetoo" or "twee-too-you, twee-too-you", repeated several times and often with introductory "trit".

**Habitat.** Almost entirely restricted to open and well-developed miombo (*Brachystegia*) woodland; occasionally in mavunda forest, and *Uapaca* and *Isoberlinia* woodlands. At 1220–1900 m in DR Congo, from 915 m (possibly as low as 400 m) to 1700 m in Malawi, and at 975–1950 m in Zambia; in Zimbabwe, above 915 m on C plateau and at 500–1600 m in E highlands.

**Food and Feeding.** Diet rather poorly known; presumably includes small invertebrates and larvae. Usually forages in pairs or in small (possibly family) groups; often joins mixed-species foraging flocks, including those with *P. cinerascens* where ranges overlap. Forages mostly in upper level and canopy, among the bark and branches (including largest limbs) of living and dead trees. Co-exists with *P. rufiventris* in mature miombo woodland, although the two species apparently occupy different niches.

**Breeding.** Season Aug–Dec. Nest a large, soft pad or cup of plant fibres, animal hair and feathers, placed in hole in tree, including old hole of woodpecker (Picidae) or barbet (Capitonidae), or in wall or fence post, or in termite hill, or in hole in ground or sloping bank, sometimes in drainpipe. Clutch 3–5 eggs, no information on incubation and nestling periods. Occasional brood host to Lesser Honeyguide (*Indicator minor*). Breeding success: 75% of nests in miombo woodland in Zimbabwe each fledged two young.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Common or locally common in much of range. In Tanzania local and sparsely distributed, and fairly common only around Mt Rungwe. Densities of 14 individuals/100 ha of miombo woodland in Zambia. Considered potentially vulnerable owing to its specific habitat requirements; appears to be replaced by *P. cinerascens* in areas where habitat destroyed and substituted by secondary scrub and thornbush.

**Bibliography.** Alerstam & Ulfstrand (1977), Britton (1980), Clancey (1996a, 1996b), Dowsett-Lemaire & Dowsett (2006), Fry *et al.* (2000), Ginn *et al.* (1989), Hall & Moreau (1970), Harrop & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Irwin (1959, 1981), Mackworth-Præd & Grant (1963, 1973), Maclean (1993), Short *et al.* (1990), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Stevenson & Fanshawe (2002).

41. Ashy Tit

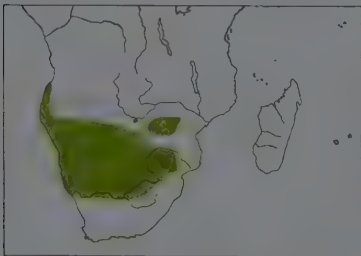
*Parus cinerascens*

**French:** Mésange cendrée      **German:** Akazienmeise      **Spanish:** Carbonero Cinéreo

**Taxonomy.** *Parus cinerascens* Vieillot, 1818, Pelladri, northern Cape Province, South Africa. Forms a superspecies with *P. thruppi*, *P. griseiventris* and *P. afer*. Has been considered conspecific with any one of those or with all of them. Birds from SE Zimbabwe and N South Africa (E Limpopo S to Free State), previously separated as race *orphnus* on basis of purer white face and nuchal patch and greyer upperparts, now considered doubtfully distinct from fresh-plumage nominate. Two subspecies recognized.

**Subspecies and Distribution.**

*P. c. benguelae* B. P. Hall & Traylor, 1959 – SW Angola, possibly also extreme NW Namibia. *P. c. cinerascens* Vieillot, 1818 – Namibia, Botswana, Zimbabwe and N South Africa (S to N Northern Cape, Free State and Mpumalanga).



**Descriptive notes.** 14.5–15 cm; 18.5–21.7 g. Large, grey tit with black-and-white head pattern and black breast. Male nominate race has forehead to crown and crown side (to below eye) and nape black, in fresh plumage slightly glossed bluish, white patch on centre of lower nape; upperparts grey, longest uppertail-coverts tipped blackish; tail black, all feathers (occasionally except central pair) tipped white, outermost narrowly edged white; upwerving-coverts blackish-grey, lesser coverts tipped as upperparts, medians and greater fringed and more broadly tipped buffish-white, alula and primary coverts black, finely fringed and tipped whitish; flight-feathers blackish-grey, tertials fringed greyish-white, secondaries as tertials but slightly duller on edges and whiter at tips, primaries finely fringed whitish; cheek, ear-coverts and neck side white; chin and throat to below ear-coverts and centre of upper breast black, slightly glossed blue on throat and breast, narrow black line from lower bib to belly bordered by narrow whitish to light greyish-buff; rest of underparts grey, except for darker undertail-coverts with whitish tips; axillaries and underwing-coverts greyish, tipped off-white; in worn plumage, crown and nape duller and less glossy, upperparts duller grey or washed brownish, less white at tips of tail, fringes of wing feathers abraded or absent, black may extend across side of neck to nape, bib duller, rest of underparts browner; iris brown to deep brown; bill black; legs blue-grey or dark grey to black. Distinguished from *P. griseiventris* by larger bill, brighter or more glossy cap, darker grey upperparts, darker underparts; from *P. afer* by grey upperparts and flanks, white (not buffish) nuchal patch, white (not pale brownish) wing edgings. Female resembles male, but is slightly browner on upperparts, including wings and tail, and bib is generally duller and less glossy. Juvenile is similar to adult, but crown to nape is sooty brown, upperparts tinged duller brown, tail darker brown with very narrow off-white tips, wings dark sooty brown, median and greater coverts have broad pale grey or buffish tips, edges of greater coverts narrower than on adult, bib browner, tinged dark grey and restricted to throat and breast, ventral line usually absent. Race *benguelae* differs from nominate in having underparts much paler, and lacking pale border between ventral line and flanks. Voice. Calls include a thin and fairly sibilant "si-si-si" or a longer and more complex series of "psi-psi" or "sisisi-si-si-si-si-si" notes, also a harsher "psi-psi-chrrr"; alarm a series of nasal rattles, dry chattering "jejejejejejeje" and prolonged "chrrrrr" or "tschrr tschrr tschrr". Song is a series of mellow trilling notes, "tlu-tlu-tlu-tlu-tlu-tlu, chi-chi-chi-chi-chi, tri-tri-tri-tri-tri", occasionally with slower variations, e.g. "trewet-treet-treet-treet-treetretretretretret". Voice very similar to that of *P. afer*.

**Habitat.** Mainly dry acacia (*Acacia*) savanna, particularly camel thorn (*Acacia erioloba*), and arid thornbush, scrub, edges of broadleaf (especially *Combretum*) woodland and riverine forest; also secondary scrub and light open deciduous woodland in South Africa (mainly W part of former Transvaal), and tall vegetation in very dry riverbeds and semi-desert country; usually avoids miombo (*Brachystegia*) woodland. Occurs at 275–1220 m in Namibia and 915–1370 m in South Africa;

mostly above 1200 m in Zimbabwe, but occasionally down to 900 m in S and to 1880 m in Inyanga highlands.

**Food and Feeding.** Diet includes small invertebrates, principally beetles (Coleoptera), moths (Lepidoptera), spiders (Araneae), ants (Hymenoptera), flies (Diptera) and larvae, also some fruit and seeds; nestlings fed mostly with lepidopteran caterpillars and pupae. Solitary, in pairs or in small groups; in non-breeding season often in mixed-species flocks, rarely including *P. griseiventris*. Forages in middle levels of trees and tall scrub, occasionally descends to ground; vigorously hammers at seedpods of camel thorn to extract invertebrate larvae.

**Breeding.** Season Sept–Apr. Monogamous; possibly a co-operative breeder, several adults attending breeding female and young at some sites. Territorial; male defends territory by vigorously singing from tall bush throughout incubation and nestling stages. Nest a cup of soft plant material, including down, animal hair and feathers, placed 2–4 m from ground in hole in tree trunk or old stump, or in hole in ground. Clutch 4–6 eggs; incubation by female, fed on nest by male, period 11–13 days; nestling period up to 22 days. Breeding success highly dependent on local rainfall; of 24 nests in Namibia, 12 failed prior to hatching owing to hot and dry weather, and remainder fledged at least one young each.

**Movements.** Resident, but locally nomadic. May wander in non-breeding season into areas of brachystegia woodland; in South Africa an irregular winter visitor to KwaZulu-Natal and possibly elsewhere in E & SE.

**Status and Conservation.** Not globally threatened. Common to fairly common or locally common. Density of 1 pair/50 ha of acacia thornveld in N South Africa.

**Bibliography.** Clancey (1958, 1996a), Dowsett & Dowsett-Lemaire (1993), Fry *et al.* (2000), Ginn *et al.* (1989), Hall & Moreau (1970), Hall & Traylor (1959), Harrop & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Irwin (1981), Mackworth-Præd & Grant (1963), Maclean (1993), McCarthy (2006), Newman (1989), Penry (1994), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Stevenson & Fanshawe (2002), Wiggins (2001).

42. Grey Tit

*Parus afer*

**French:** Mésange petit-deuil      **German:** Kapmeise      **Spanish:** Carbonero Gris  
**Other common names:** Southern Grey Tit, Acacia (Grey) Tit, African Grey Tit

**Taxonomy.** *Parus afer* J. F. Gmelin, 1789, Cape of Good Hope, South Africa. Forms a superspecies with *P. thruppi*, *P. griseiventris* *P. cinerascens*. Has been considered conspecific with any one or all of those. Two subspecies recognized.

**Subspecies and Distribution.**

*P. a. afer* J. F. Gmelin, 1789 – W South Africa (Northern Cape, Western Cape) and apparently also E, C & S Namibia. *P. a. arens* Clancey, 1963 – Lesotho and S South Africa (S Free State, W Eastern Cape).



**Descriptive notes.** 14–15 cm; 17.3–22.4 g. Medium-sized to large, dark grey tit with black head to breast and white lower face. Male nominate race has forehead to crown (to below eye) and nape black, in fresh plumage slightly glossed bluish; buffish or greyish-white nuchal patch; upperparts grey or dull brownish-grey, longest uppertail-coverts tipped blackish; tail sooty black, all feathers tipped dull whitish (may be reduced to small spot on central pair), outermost also narrowly edged whitish; upwerving-coverts dark grey-brown, lesser coverts tipped as upperparts, medians and greater fringed and more broadly

tipped off-white or buffish, alula and primary coverts black, finely fringed greyish; flight-feathers blackish-grey, tertials fringed dull greyish-white, secondaries and primaries finely fringed dull greyish-white; cheek, ear-coverts and neck side off-white; chin and throat to below ear-coverts and broad centre of upper breast black, slightly glossy blue on throat and breast, tapering into a narrow black line down to vent; sides of breast and belly white, washed pinkish, flanks pale buff or pinkish-buff, undertail-coverts darker with paler tips; axillaries and underwing-coverts blackish, tipped buffish to greyish-white; in worn plumage, crown and nape darker, less glossy, upperparts darker and washed brownish (less grey), white tips of tail abraded or absent, fringes of wing feathers abraded or absent (but tips to greater coverts may be bleached whiter), bib duller brown, rest of underparts more buffish; iris dark brown to black; bill black; legs grey, blue-grey or black. Distinguished from *P. cinerascens* and *P. griseiventris* mainly by shorter tail, buffish or greyish nuchal patch, duller upperparts and wing edgings, buff on underparts. Female resembles male, but slightly browner on crown, bib smaller and duller and usually more rounded (less pointed) on lower edge, and ventral line narrower. Juvenile is as female, but crown to nape browner, upperparts tinged duller brown, tail darker brown with narrower off-white tips (except outermost feather, which more broadly fringed and tipped off-white), bib browner; first-year separable from adult by contrast between fresh greater coverts and tertials and old primary coverts, primaries and secondaries. Race *arens* differs from nominate in having mantle, back and rump darker, deep greyish-olive, underparts slightly duller, more heavily buff-brown on sides of breast and belly, ventral stripe broader on upper belly, and flanks to vent duller and greyer, washed dull buff. Voice. Calls include series of thin and fairly sibilant "tsi-cha-cha-cha" or "tsisisi-cha-cha-cha-cha", and very similar to some calls of *P. cinerascens*; alarm a harsh "tchiptchre-tchre-tchre-tchre-tchre-tchre-tchre...", slightly softer than that given by *P. niger*. Song a series of repeated loud phrases, e.g. "we-toolee-too, we-toolee-too", "klee-klee-klee, chere-cheree, pee-peeoo, pee-peeoo pee-peeoo, piet-jou-jou" or "piet-jou-jou, tui-tui-tui", rather like notes of a *Turdus* thrush.

**Habitat.** Dry thorn-scrub, including arid Karoo areas of semi-desert, scrubby or bushy patches and fynbos, in open rocky country with gorges, including dry rivercourses and edges of agricultural areas; appears to favour lower-growth areas of vegetation, rather than trees; in S of range occurs principally in open *Tarchonanthus*/*Acacia* scrub. At 1220–1320 m in Namibia, 400–945 m in W South Africa (Northern Cape), and to 2745 m in Lesotho.

**Food and Feeding.** Diet includes small invertebrates, particularly wasps (Hymenoptera), ants (Formicidae), beetles (Coleoptera), spiders (Araneae) and larvae, especially moth caterpillars (Lepidoptera) up to 4 cm long; also fruit of honey-thorns (*Lycium*). Usually in pairs or in small, probably family, groups of up to six individuals; also in mixed-species foraging flocks containing crombecs (*Sylvietta*), Black-chested Prinia (*Prinia flavicans*), Rufous-eared Warbler (*Malcorus pectoralis*) and Cape Penduline-tit (*Anthoscopus minutus*). Active and restless. Forages in foliage of bushes, scrub and low shrubby trees; appears to locate prey items also from within bark on lower trunks and branches of taller trees. Hangs upside-down to locate and open items on undersides of branches; pecks or hammers at food items held in foot. Also opens up holes in thorns and acacia seedpods,

especially those of camel thorn (*Acacia erioloba*), by repeated pecking in order to extract insect larvae.

**Breeding.** Season Aug–Mar. Possibly a co-operative breeder. Nest built by both sexes, a thick pad or cup of grass, plant fibres, animal hair, wool and feathers, placed in hole or cavity in rocks, culvert or bank, or in drainpipe, fence post or old building, occasionally in tree if available in habitat. Clutch 2–5 eggs; incubation period up to 14 days; chicks fed by up to four adults at some nests, no information on duration of nestling period.

**Movements.** Resident or locally nomadic.

**Status and Conservation.** Not globally threatened. Uncommon or scarce. Fairly common in South Africa around Cape Town. Apparently present in Kwazulu-Natal (E South Africa) prior to 1970, but no recent records from there. Status of population in Namibia questioned; possibly requires confirmation.

**Bibliography.** Clancey (1996a), Dowsett & Dowsett-Lemaire (1993), Fry *et al.* (2000), Gill *et al.* (2005), Ginn *et al.* (1989), Hall & Moreau (1970), Harrap & Quinn (1996), Harrison *et al.* (1997), Hockey *et al.* (2005), Irwin (1959), Mackworth-Praed & Grant (1963), Maclean (1993), McCarthy (2006), Sinclair & Ryan (2003), Sinclair *et al.* (2002), Stevenson & Fanshawe (2002).



inches 3  
cm 8

PLATE 55



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## 43. Great Tit

*Parus major*

**French:** Mésange charbonnière    **German:** Kohlmeise    **Spanish:** Carbonero Común  
**Other common names:** Grey Tit(!); Cinereous Tit ("cinereus group"); Japanese Tit (*minor*)

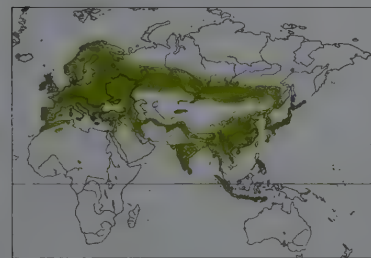
**Taxonomy:** *Parus major* Linnaeus, 1758, Europe.

Part of a species group which includes also *P. bokharensis*, *P. monticolus* and *P. nuchalis*. Forms a superspecies with *P. bokharensis*; has been treated as conspecific, but the two interbreed only rarely and locally, and genetic evidence indicates that they are better considered separate species. Hybridizes, very rarely, also with *Periparus ater* and *Cyanistes caeruleus*, and possibly with *Poecile palustris*. Geographical variation highly complex, and to some extent clinal, but three groups of races, or "sections", traditionally recognized: "nominate section", in Palearctic (except far E), containing the green-backed, yellow-bellied races (the first 12 of those listed below); "cinereus section", from SW Asia and Indian Subcontinent E to Indochina and Indonesia, containing the grey-backed, whitish-bellied forms (the next 13 in list); and "minor section", from E Asia and Japanese islands, incorporating the greenish-backed, white-bellied races (the final 9 in list). Recent analyses, using DNA evidence and hybridization studies, suggest that these sections should perhaps be treated as three separate species, largely isolated from one another by major landforms (e.g. Himalayas); also some differences in voice and habitat. On the other hand, a degree of intergradation and/or hybridization is evident in areas where groups meet, e.g. intergrades between *blanfordi* and *intermedius* and between *kapustini* and *minor* occur; further, race *karelini* thought by some to represent intermediate population between the first two of those, and is often included within nominate, and, moreover, *intermedius* and *commixtus* are themselves sometimes considered to represent merely intergrade populations. Some intergradation also within sections (e.g. between nominate and *aphrodite* in S Europe). Otherwise, within "minor group", birds from S China (SW Sichuan S to SE Xizang, Yunnan and W Guizhou) currently included within race *tibetanus*, but sometimes separated as *subtibetanus*, and *kagoshimae* merged with *minor* by some authors. Thirty-four subspecies presently recognized.

**Subspecies and Distribution.**

- P. m. newtoni* Prazák, 1894 – British Is, Netherlands, Belgium and NW France.  
*P. m. major* Linnaeus, 1758 – mainland Europe (Scandinavia S to N & C Spain, C Italy and Balkans), W & SC Siberia (E to L Baikal, S to N & E Kazakhstan and Altai), Asia Minor, Caucasus and Azerbaijan (except SE).  
*P. m. kapustini* Portenko, 1954 – SE Kazakhstan (Dzungarian Alatau), extreme NW China (NW Xinjiang) and NW Mongolia E to Transbaikalia, SE Russia (N Amurland) and Sea of Okhotsk.  
*P. m. corsus* O. Kleinschmidt, 1903 – Portugal, S Spain and Corsica.  
*P. m. mallorcae* Jordans, 1913 – Balearic Is.  
*P. m. excelsus* Buvry, 1857 – NW Africa (Morocco E to N Tunisia).  
*P. m. ecki* Jordans, 1970 – Sardinia.  
*P. m. aphrodite* Madarász, 1901 – S Italy, S Greece, Aegean Is and Cyprus.  
*P. m. niethammeri* Jordans, 1970 – Crete.  
*P. m. terraesanctae* E. J. O. Hartert, 1910 – Lebanon, Syria, Israel, Jordan and NE Egypt.  
*P. m. karelini* Zarudny, 1910 – SE Azerbaijan and NW Pakistan.  
*P. m. blanfordi* Prazák, 1894 – N Iraq and NC & SW Iran.  
*P. m. intermedius* Zarudny, 1890 – NE Iran and SW Turkmenistan.  
*P. m. decolorans* Koelz, 1939 – NE Afghanistan and NW Pakistan.  
*P. m. ziaratensis* Whistler, 1929 – C & S Afghanistan and W Pakistan.  
*P. m. caschmirensis* E. J. O. Hartert, 1905 – NW Himalayas E from N Pakistan.  
*P. m. nipalensis* Hodgson, 1837 – N India and Nepal E to W & C Myanmar.  
*P. m. vauriei* Ripley, 1950 – NE India (E Assam).  
*P. m. stupae* Koelz, 1939 – W, C & SE India.  
*P. m. maharattarum* E. J. O. Hartert, 1905 – SW India and Sri Lanka.  
*P. m. templeorum* Meyer de Schauensee, 1946 – W Thailand and S Indochina.  
*P. m. hainanus* E. J. O. Hartert, 1905 – Hainan I.  
*P. m. ambiguus* (Raffles, 1822) – Malay Peninsula and Sumatra.  
*P. m. sarawacensis* Slater, 1885 – NW, NE & SE Borneo.  
*P. m. cinereus* Vieillot, 1818 – Java and Lesser Sundaes.  
*P. m. minor* Temminck & Schlegel, 1848 – Russian Far East (C Amurland, Ussuriland), S Sakhalin I, NE & EC China (S to R Yangtze), Korea and Japan (S to Kyushu).  
*P. m. dageletensis* Nagamichi Kuroda & Mori, 1920 – Dagelet I (E of S Korea).  
*P. m. kagoshimae* Takatsukasa, 1919 – S Kyushu and Goto Is.  
*P. m. amamiensis* O. Kleinschmidt, 1922 – N Ryukyu Is (Amami-oshima, Tokunoshima).  
*P. m. okinawae* E. J. O. Hartert, 1905 – Okinawa, in C Ryukyu.  
*P. m. nigriloris* Hellmayr, 1900 – S Ryukyu (Ishigaki, Iriomote).  
*P. m. tibetanus* E. J. O. Hartert, 1905 – SW & SC China (SE & E Xizang, S & E Qinghai and W Sichuan S to Yunnan and W Guizhou) and N Myanmar.  
*P. m. commixtus* Swinhoe, 1868 – NE Vietnam and SE China (E from Yunnan, S of R Yangtze).  
*P. m. nubicolus* Meyer de Schauensee, 1946 – E Myanmar, N Thailand and NW Indochina.

**Descriptive notes.** 12.5–14 cm; 11.9–22.1 g. Large, black-headed tit with large white face patch, and pale or yellow underparts divided by black ventral line. Male nominate race has forehead to crown (to below eye) and nape glossy bluish-black, dull whitish patch on centre of lower nape becoming greenish-yellow on lowermost hindneck and upper mantle; rest of mantle, scapulars and upper back green, scapulars tinged olive, lower back to uppertail-coverts light bluish-grey, tinged green on rump, longest uppertail-coverts and tail bluish-grey with blackish inner webs, outer three rectrices tipped white (minutely on innermost of the



three), on outermost rectrix white extends as a wedge to about half feather length on inner web and over entire outer web; lesser and median upperwing-coverts greyish-blue, greater with blackish on inner webs and fringed finely greenish on outer and broadly tipped white, alula and primary coverts black, finely fringed white; flight-feathers blackish-grey, tertials broadly fringed pale green-

ish-yellow (becoming white towards tip), secondaries and inner primaries finely fringed pale greyish-blue; cheek and ear-coverts white, chin, throat and neck side to centre of upper breast black (slight blue gloss on throat and breast), fairly broad but irregular black line from lower bib to vent; sides of breast and belly bright lemon-yellow, flanks washed grey-green, undertail-coverts white with tips of longest blackish; axillaries and underwing-coverts whitish; in worn plumage, crown and nape duller, less glossy, upperparts duller green, ventral line slightly broader, rest of underparts paler yellow, or greyer on flanks; iris dark reddish-brown to blackish-brown; bill black, paler cutting edges; legs slate-grey to blue-grey. Differs from *P. bokharensis* mainly in slightly smaller white cheek patch, blue-grey fringes to flight-feathers, slightly larger size and larger bill, shorter tail; some races with greener (less grey) upperparts, bright yellow (not whitish) on underparts. Female like male, but slightly duller black on crown, upperparts duller or darker green, fringes of greater coverts and secondaries greenish-grey (not greyish-blue), black on side of neck narrower or broken, bib duller black, ventral line narrower and less intensely black (may be broken or show white tips towards vent), undertail-coverts more extensively white. Juvenile is as female, but crown to nape browner or brownish-olive, nuchal spot small and dingy, upperparts dull olive-green, greyer on rump and uppertail-coverts, tail duller and greyer with poorly defined whitish tips on outer two feathers, wing-coverts washed or fringed olive, flight-feathers dark grey, fringed grey-green on secondaries and pale grey on primaries; cheeks, ear-coverts and neck side pale yellow (whiter when worn), small dark grey bib in breast centre and trace of narrow dark grey ventral line, rest of underparts pale yellow, greyish wash on flanks; iris paler or greyer. Races fairly well defined, differing mainly in size, bill shape, intensity of yellow in plumage, and extent of white in outer tail: *newtoni* is as nominate, but bill slightly longer (and culmen less curved), mantle slightly deeper green, less white in outer tail, male with ventral line broadly black and widening on belly, female with black areas duller, ventral line also narrower and can be broken on lower belly; *kapustini* is paler above and below than nominate; *corsus* is as nominate, but upperparts slightly duller or darker, greyish-olive, has less yellow on nape and less white in tail, and underparts paler yellow except for greyish wash on flanks; *mallorcae* differs from nominate in slightly larger bill, more greyish-blue upperparts, slightly paler (pale yellow to greyish-white) underparts, less white in tail; *ecki* resembles last, but with bluish tinge on upperparts and slightly paler underparts; *excelsus* is as nominate, but brighter olive-green above, very little or no white on outer tail feather, underparts bright yellow (deeper than in previous two); *aphrodite* has upperparts slightly darker than nominate, more olive-grey, and underparts variably yellow to pale cream; *niethammeri* is very similar to last but with slightly larger bill, upperparts slightly duller or darker, less green, and underparts very pale yellow; *terraesanctae* is as previous two, but upperparts slightly paler; *blanfordi* is as nominate, but mantle and scapulars duller or greyer, underparts pale yellow (but darker in E & S Elburz Mts and into N Iraq), and more white in outer tail feather; *karelini* very similar to last or intermediate between it and nominate, but with less white in tail; *caschmirensis* has upperparts bluish-grey (darker than *ziaratensis*), tail blackish-grey and broadly fringed bluish-grey, outer rectrix entirely white and adjacent one white except on edge of inner web, tertials broadly fringed pale grey, flight-feathers narrowly edged same, underparts off-white or tinged buffish, slightly whiter on breast side and border of ventral line; *intermedius* is similar to last, but upperparts light bluish-grey (may be faintly tinged greenish), upper mantle tinged olive, greater coverts edged pale bluish-grey, alula black, much less white in tail, underparts creamy to pale greyish-white; *ziaratensis* is also similar but with slightly smaller bill, paler upperparts, broader and whiter edges of tertials, underparts whiter; *decolorans* has underparts darker and flanks greyer; *nipalensis* is also like *caschmirensis*, but upperparts slightly darker grey, tinged bluish, less white in tail (but outermost feather white), tips of greater coverts narrower and whiter, fringes of tertials whiter, underparts whiter; *vauriei* resembles previous, but flanks slightly greyer, white in outer tail restricted to distal half of outermost rectrix; *stupae* is similar to *caschmirensis*, but slightly darker bluish-grey above, greater coverts narrowly fringed bluish-grey, tertials whiter, outer tail feather white and adjacent one extensively so, underparts paler or tinged pale pinkish-buff (usually heaviest on female) except for pale grey flanks; *maharattarum* is closest to previous, but upperparts slightly darker or more heavily bluish-grey, less white in tail (outermost feather all white, but next one only half white), underparts duller smoky grey; *templeorum* is very like *nipalensis*, differs chiefly in having more black on greater wing-coverts; *hainanus* is similar to *caschmirensis* but slightly darker above, mantle often washed olive, greater coverts mostly black (narrowly fringed bluish-grey and tipped white), tertials fringed white, outermost rectrix white and distal half of inner web of adjacent one white, underparts pale greyish-white or dull cream, flanks greyer; *ambiguus* is also similar but smaller, with slightly darker upperparts, smaller nuchal patch, greater coverts black with thin bluish fringes, tertials fringed pale grey, white in tail reduced to most of outermost feather and tip of next, underparts slightly darker; *cinereus* is similar to previous, but upperparts slightly darker blue-grey, underparts paler and tinged pinkish, outer tail feather white and tips of next two also white; *sarawacensis* resembles last, but white nuchal patch reduced or absent, upperparts slightly darker grey, uppertail-coverts black, tail feathers also black with narrow grey fringes and white restricted to outermost rectrix (which has base of inner web black), underparts pale greyish-white, blackish ventral stripe broad; *minor* is similar to nominate, but uppermost mantle olive-yellow, becoming plain olive below and greyish-olive on scapulars and back, underparts mostly whitish, breast side and upper flanks washed pinkish-buff, lower flanks greyish, female also as nominate but with olive fringes of tertials; *dageletensis* is as previous but has less olive-green on mantle, underparts whiter, dark ventral line narrower; *kagoshimae* is similar but with darker flanks; *amamiensis* has olive-green only on upper mantle, contrasting with greyer lower mantle, back and rump; *okinawae* is as previous but less green (merely washed green on upper mantle), lower mantle to back and rump darker bluish-grey; *nigriloris* is similar to last but darker, lacks nuchal patch, green on mantle replaced by bluish-black (slightly glossy), becoming dark bluish-grey on rest of upperparts, tail mostly blackish-grey (white restricted to tip of outermost feather), lores and neck side broadly black and merging with bluish-black of bib (white on cheeks and ear-coverts reduced), underparts darker, with narrow whitish-grey border to lower bib and ventral line; *tibetanus* is similar to *minor* but larger, has dull olive or greenish-olive upperparts (much duller grey in worn plumage), more white in outer two tail feathers; *nubicolus* resembles last, but upper mantle slightly more yellow; *commixtus* is similar to *minor*, but generally less olive-green on mantle, greyer lower mantle and scapulars, variable amounts of white in outer two rectrices, and underparts slightly darker (tinged pinkish in fresh plumage).

**VOICE.** Male particularly vocal throughout year, with large repertoire and variety of calls, up to 40 distinct notes recorded. Single call notes include soft "pit", "spick", "chit" or "squink", often as contact when foraging and as introductory notes to longer series of other calls, a loud metallic "tink" or "chink" used almost exclusively by adult male in variety of situations e.g. alarm, territory defence (often during prolonged "tinkling duels" with rivals at territory boundaries), aggression and during winter flocking, and very similar to one of the calls given by Common Chaffinch (*Fringilla coelebs*), similarity further enhanced when repeated as rapid double or treble "tink-tink-



tink", also often as precursor to full song; may be given also by female in territory defence close to nest-site, often with thin or sharp "tsee". Churring "chich-ich-ich-ich" or "chach-ach-ach" (similar to that of *Cyanistes caeruleus* but louder), often preceded with single "tsee", "tink" or "pee-tink", may be given lightly as contact between partners, also during courtship, and more prolonged, emphatic and harshly when alarmed or agitated; also a dry, rising "chur-r-r-rihihi", often as prelude to heavy scolding churr. Other calls include dry, nasal "tcha-tcha-tcha" (variation of churring call) and reminiscent of similar phrase of *Poecile palustris*, rather explosive "chack-chack-chee..." and "spick-spick-pee-peu-peu", and variety of similar notes, including "tsee-tsui" in anxiety and aggression; during courtship and display male gives low warbling "ziddle zeeeeeeee" or "tri li li deeeee", female responding with similar but lower "zeedle-zeedle-zeedle" (occasionally as more rapid "zzrrree zrrree..."); female on nest may give loud, explosive hissing note, possibly as defence against potential predator. Fledglings have loud, high-pitched "tsee-tsee-tsee-tsee-tsee" or more emphatic "zicker-zicker-zicker", and shorter "zi-zi-zi" contact note. Song almost entirely uniform across range (but in playback experiments captive female *cinereus* showed no reaction to song of nominate, although song of *cinereus* elicited full territorial response when played to *minor* from SE Russia); male territorial song usually a loud, sharp and slightly metallic "tea-cher, tea-cher", "teecheewee teecheewee", "tsi-tsi-daa tsi-tsi-daa" or "zizibaah zizibaah", usually repeated several times (exceptionally, up to ten times); only slight geographical variation, e.g. throughout Indian Subcontinent, Malay Peninsula and Indonesia ("cinereus group") song "chew-a-ti, chew-a-ti, chew-a-ti", "sweet-pepe-ti, sweet-pepe-ti" or "weeter-weeter-weeter" and the like; also usual for males to have at least three songs of differing tempo. Song of female very similar to that of male but rarely given. Both sexes give soft subsong (normally from within foliage, almost inaudible except at close range) of random warbled notes, usually from end of winter to start of nest-building or fledging of young.

**Habitat.** Mostly open deciduous and mixed forests and edges and clearings in dense forest, including conifer forests and boreal taiga of N Siberia; also more widely in plantations, hedgerows, orchards, parks, gardens (including in urban and suburban areas), edges of cultivation, olive groves and almost any group of trees or bushes. In Europe shows preference for oaks (*Quercus*); in Siberia, W China and Mongolia principally in riverine birch (*Betula*) or willow (*Salix*) thickets and mixed forest, and in isolated clumps of trees on otherwise open steppe, around villages and other settlements, in Mongolia also in open semi-desert and montane forest. In SW Jordan a small population exists in scattered junipers (*Juniperus*) and oleanders (*Nerium*) at edges of wadis; in NW Africa favours cork oak (*Quercus suber*) and holm oak (*Quercus ilex*) and Atlas cedars (*Cedrus atlantica*), and occurs in palm groves in S Morocco. In W Pakistan (Baluchistan) breeds in juniper and pine (*Pinus*) forest, but in Himalayas mostly in deciduous and mixed forest, preferably open forest of oak, but also horse chestnut (*Aesculus*), pine and deodar (*Cedrus deodora*) and, E of N Pakistan, sal (*Shorea*) forest and acacia (*Acacia*) groves, and at higher levels in orchards, poplars (*Populus*) and willows; in peninsular India, W Myanmar and N Thailand found mainly in dry deciduous forest, groves or scattered trees in open and hilly country, but rarely in evergreen forest (except in NW Thailand, where evidently prefers stands of pines in evergreen forest); in non-breeding season in wider variety of habitats, including roadside and riverine trees and scrub-forest. In N Laos occurs in pine woods and in deciduous dipterocarp in S; in Malay Peninsula and Borneo only in coastal and riverine forest, nipa palms, *Casuarina* stands and mangroves. In Greater and Lesser Sundas found in wide variety of deciduous, coniferous and secondary forests, including montane heath and grasslands above tree-line. In Europe principally in lowlands (rare above 500 m in Scotland), but to 1950 m in Switzerland; in Middle East to 1800 m in Lebanon, and in NW Africa to 1850 m; in NE Afghanistan 1000–2600 m, and in Himalayas mostly to 1800 m but 1200–2440 m in NW India (and to 3660 m in Chitral and Ladakh), and exceptionally to 3050 m in summer in Nepal, generally lower in E Himalayas (but to c. 1500 m in Arunachal Pradesh); in peninsular India at 610–915 m in Eastern Ghats and 120–2285 m in Kerala, and in Sri Lanka mostly 600–1770 m (or lower locally); in C China 300–1650 m (most towards upper limit, owing to persecution and lack of lowland habitat), but in S up to 4040 m in Xizang and 4420 m in Sichuan; at 500–1100 m in W Myanmar (Mt Victoria) and 800–2135 m in NW Thailand, and to 2000 m in Sumatra and Java; in Lesser Sundas, from sea-level to 930 m on Sumba, to above 1000 m on Sumbawa, 1400 m on Flores and 2400 m on Lombok; in Japan occurs to 1800 m, exceptionally to 2200 m.

**Food and Feeding.** Well studied. Food in summer mostly small invertebrates and larvae (usually up to 1 cm); at other seasons also seeds and various other items. Invertebrates include cockroaches (Blattodea), grasshoppers and crickets (Orthoptera), damselflies and small dragonflies (Odonata), lacewings (Neuroptera), earwigs (Dermaptera), bugs (Hemiptera) including aphids (Aphidoidea), ants (Formicidae), millipedes (Diplopoda), mites (Acari), moths (Lepidoptera), flies (Diptera), caddis flies (Trichoptera), scorpion flies (Mecoptera), bees (from which stings usually removed) and wasps (Hymenoptera), beetles (Coleoptera), spiders (Araneae), harvestmen (Opiliones), snails (Gastropoda), woodlice (Isopoda). Seeds and fruit (mostly in non-breeding season) mainly those of deciduous trees and shrubs, particularly seeds of beech (*Fagus sylvatica*) and hazel (*Corylus avellana*); also takes spilled grain (mostly wheat and maize) in fields, and takes fat, bread, cheese, household scraps (including meat), peanuts and sunflower seeds from birdtables (in severe winter weather estimated to consume 44% of its own weight in sunflower seeds); also takes nectar from fritillary (*Fritillaria*) and currant (*Ribes*) and sap from walnut (*Juglans*) and vines (*Vitis*). Nestlings fed mostly (not exclusively) with lepidopteran larvae, especially in deciduous woodland; in pine woods, spiders, beetles and sawfly larvae (Symphyta) form greater proportion of diet. In Britain and some other parts of Europe, shares with *Cyanistes caeruleus* the acquired habit of piercing milk-bottle tops on doorsteps to sip cream. Does not store food, but may steal from caches of tits that do (e.g. *Parus ater* and *Poecile palustris*); highly intelligent and quick to learn, especially from partner or from others in flock, where to find hidden food. Seeds, particularly hard-shelled ones and nuts, often collected and taken to branch, where held firmly by foot (or feet) and rapidly hammered with the bill until a hole is made through which the kernel can be extracted; some, particularly larger seeds, may be wedged in bark before being opened. Occurs singly or in pairs, also in groups, in autumn frequently in large groups consisting solely of juveniles, and in winter up to 50 together (including first-years and adults) as part of a mixed-species foraging flock. Within single-species flock males dominate, and hierarchy of males usually dependent on proximity of territory, with territory-owner usually most dominant; dominance in winter flock increases likelihood of surviving winter. Forages at all levels in trees, but usually avoids tallest canopy; most often in lower levels of trees, where it gleams among foliage, branches and trunks, also in shrubs and tall undergrowth. Also on ground, especially male in non-breeding season, where collects fallen seeds, berries and invertebrates. Occasionally hovers for very brief moments, but rarely pursues insects in flight; commonly hovers at garden feeders and birdtables. One of the few bird species known to use a tool in obtaining food items; recorded as holding a conifer needle in the bill and using it as a means of extracting larvae from hole in tree.

**Breeding.** Season mostly late Jan to Sept (lays from late Mar onwards in W Palearctic), in Israel also exceptionally Oct–Dec (following post-breeding moult), start of laying usually heavily influenced by amount of sunlight and daytime temperatures (or provision of extra food), also by altitude and by age of female; breeds throughout year in Java, with peak Apr–Jun; usually two broods (less

frequently in deciduous woodland), rarely at same site but can be up to 200 m apart, and three broods not unknown. Monogamous, rarely polygamous; pair-bond lasts for duration of breeding season, may re-form in autumn and in following season (if both partners still alive). Territorial, boundary usually established by late Jan, and enforced with aggressive behaviour (mostly towards trespassing first-year birds) from late winter and early spring, defence usually declines following completion of clutch but in some areas maintenance of territory may be central to successful breeding; in S of range (Israel) territorial throughout year, and does not form flocks; generally solitary breeder, but pairs sometimes nest very close to each other, e.g. simultaneously in nestboxes 3–4 m apart in same tree. Displaying male keeps slightly higher than female, perches horizontally or hops with wings slightly raised and opened, tail raised and partly spread, occasionally raises and lowers tail and shivers wings while giving warbling trill, both birds then flying with shallow wingbeats or gliding to area of hole and inspecting potential nest-site; male courtship-feeds female, which crouches on branch and shivers wings, begging by female increases at start of egg-laying, during start of incubation and just before young leave nest. Nest built by female, mostly of plant fibres, grasses, moss, animal hair, wool and feathers, placed at variable height in hole or cavity in tree, occasionally in wall, rock face or building, frequently in nestbox (often used in preference to natural hole; in some cases entire population dependent on availability of boxes), exceptionally in old squirrel (Sciuridae) drey, in disused nest of other bird or in dense tangled vegetation; sometimes (especially "cinereus group") in rodent burrow, and in E of range often in hole in bank or ground; territory size variable, 0.5 ha to c. 3.6 ha. Clutch generally 5–12 eggs, slightly fewer in second broods and in areas of poor habitat, occasionally more, up to 18; incubation by female, fed on nest by male, start often delayed for several days (exceptionally, a week) after clutch completed or may begin up to three days before completion, incubation period 12–15 days; chicks fed by both parents, daily intake of food by nestlings c. 6–7 g but varies with availability of food (less on cold and wet days), can survive and fledge on as little as 3.2 g per day, and first broods receive more than do second broods; nestling period 16–22 days; young become independent c. 8 days after fledging, but often fed by parents (especially male) for up to 25 days more, and those of second broods may be fed for up to 50 days. Breeding success variable and dependent on a wide range of factors, including age of adults, rate of predation, starvation, changes in temperature and prolonged cold or rain in summer; age of male affects number of fledged young, age of female affects laying date and clutch size; established pairs have larger clutches and higher success rate than those breeding for first time (even when one partner has bred previously). Number of young fledged (as proportion of eggs laid) variable between broods and habitats, in S England broadleaf woodland 95% (1st brood) and 59% (2nd brood); in W German larch wood 61% (1st brood) and 76% (2nd brood); in S France evergreen oak woodland 42% (1st brood, largely as a result of unexplained desertion) and 55% (2nd brood); birds breeding in conifer woodlands appear to do better, with S England pines 60–62% (1st brood) and 78–87% (2nd brood), and 97% of 1st broods in conifer woodland in Sweden. In S England study in deciduous woodland 23% of nests failed due to predation by weasels (*Mustela nivalis*) over 29-year period, with marked fluctuation from year to year depending on availability of alternative prey; other significant predators include grey squirrel (*Sciurus carolinensis*), Eurasian Sparrowhawk (*Accipiter nisus*), Great Spotted Woodpecker (*Dendrocopos major*), Eurasian Jay (*Garrulus glandarius*) and cats. Mortality rate of juveniles rather high, 71% of young die within 400 days of fledging, greatest cause of death starvation; juveniles from second broods particularly vulnerable, have to compete with older, more dominant and frequently aggressive first-brood juveniles for food and foraging areas. Breeds within first year. Adult mortality fairly high, about half of breeding adults not reaching subsequent breeding season; ringing studies in England give annual survival rate c. 44% for males and c. 52% for females (mortality significantly lower in years of low population than in years when population high), and studies elsewhere in Europe show that adult mortality is comparable to that found in England, rising to 70% in St Petersburg (Russia), but mortality rate among first-years variable (from 61% in Czech Republic to 87% in Netherlands); mortality also increases for adults more than 5 years old, after which age females have lower reproductive rate and young have lower post-fledging survival rate. Maximum recorded longevity 15 years.

**Movements.** Resident, altitudinal migrant and partially eruptive. In C & S Europe largely sedentary, but also eruptive in autumns when population high (and often when beech crop poor and in conjunction with other factors). In late summer and autumn, dispersing flocks of juveniles (which can include some only c. 1 week out of nest) wander in random manner usually within a short distance of breeding range (second-brood young generally moving farther than those fledged earlier), but may gather in larger numbers at favourable feeding localities; by late autumn or early winter numbers within flocks usually reduced by c. 50% through death or emigration, and flock usually more settled in area that it will occupy throughout winter. Adults (especially males) remain on breeding territory throughout year if conditions permit (including in areas of NW Siberian taiga), but may join flocks for short periods in mid-winter, especially when flocks pass through territory (in late winter, males more likely to be within territory in preparation for breeding season). Evidence from ringing in British Is shows most movements within 10 km, and that 95% of females refound within 36 km of place of ringing and same number of males within 20 km, exceptions being mid-winter movements across North Sea to Netherlands and Lithuania. In eruption years, flocks usually totalling no more than 2000 individuals, mostly of first-year birds from N populations (where winter daylight too short to find food), move S & W in Sept and Oct to around Baltic region (30% of recoveries from Moscow region within 100 km SW of ringing site), Netherlands, Britain and Ireland; some travel farther, 1700–2700 km, to as far S as the Balkans, upper reaches of R Danube, Switzerland and NE Italy; included in such movements are birds from Russia recovered in Germany, Netherlands and Britain, and in extreme cases individuals from Kaliningrad (W Russia) reaching S Ireland and SW France. In NW Russia in vicinity of large cities, most first-years and adults are resident; mostly resident also in Latvia, but in Lithuania more migratory, with recoveries in S France and Portugal; similarly, many first-years from W Siberia recovered S of breeding range in Kazakhstan. Return movements to breeding areas in Feb–Mar, but in eruption or invasion years individuals may remain to breed in areas occupied during the winter (spread of range into N Norway resulted from winter invasions). In Vladivostok region of SE Russia, some resident but majority depart from breeding areas in Sept–Oct and return Mar–Apr; in Japan, many in N (Hokkaido) move SW to Honshu after breeding. Many of those breeding at higher elevations in Asia, as e.g. in parts of Indian Subcontinent and China, descend to lower levels after breeding. Vagrants recorded in Iceland, Canary Is (Tenerife, Fuerteventura), Malta, Bering Straits (Little Diomedé I) and Taiwan.

**Status and Conservation.** Not globally threatened. Common, locally common or abundant; not uncommon in Morocco but scarce N Algeria, and rare Saharan Atlas; rare in S Bhutan. Status in Borneo requires clarification, species perhaps only locally common and confined to coastal and riverine forests and mangroves. In Lesser Sundas, moderately common or very common at sea-level and above 1000 m on Flores; also two old records on Timor, where status requires confirmation. Estimated European breeding population (excluding Russia) 40,000,000–60,000,000 pairs. Densities in S England (pairs/km<sup>2</sup>) 20–320 in mixed deciduous woods, 80–330 in oak woodland, 6–53 in pine plantation; in NE Poland (Białowieża forest), 24 pairs/km<sup>2</sup> in alder (*Alnus*) swamp-forest, 26 in mixed ash-alder (*Fraxinus-Alnus*) forest, 19–24 in mixed oak-hornbeam (*Quercus-*



*Carpinus* forest and 1–2 in mixed coniferous forest. During 20th century, range in Europe expanded N into Norway, Finland and N Scotland, also significant increases in Netherlands and Estonia, and by more than 50% in Ukraine, since 1970. In E Mediterranean, spread S in Israel between 1950 and 1970 with growth of human settlements; became established in N Sinai (NE Egypt) in early 1970s and now locally common there. Since 1978 has spread to S Kamchatka, where now resident around towns and adjacent areas of forest. Generally, a very familiar parid in much of its range, and one of the world's best-studied avian species.

**Bibliography.** Ali & Ripley (1983), Andrews (1995), Armstrong (1991), Barnes (1975), Betts (1955), Brazil (1991), Brown & Grice (2005), Clarke (2006), Coates & Bishop (1997), Cramp & Perrins (1993), Delacour & Vaurie (1950), Dementiev *et al.* (1954, 1970), Dolgushin *et al.* (1972), Duckworth *et al.* (2002), Étiénope & Hùe (1967, 1983), Fleming *et al.* (1979), Flint *et al.* (1984), Formozov *et al.* (1993), Fry *et al.* (2000), Gibb (1950, 1954), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Gompertz (1961), Goodman & Meininger (1989), Gosler (1993), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hall & Moreau (1970), Handrinos & Akriotis (1997), Harrap & Quinn (1996), Harrison (1982), Hartert (1905, 1921, 1923), Hinde (1952), Hollom *et al.* (1988), Hùe & Étiénope (1970), Jeyarajasingam & Pearson (1999), Johansen (1944), King *et al.* (1975), Kluijver (1951), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillips (1993), van Marle & Voous (1988), McCarthy (2006), Medway & Wells (1976), Perrins (1979), Perrins & McCleery (1985), Porter *et al.* (1996), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000, 2005a), Rogacheva (1992), Shirihai (1996), Smythies & Davison (1999), Snow (1954a), Spierenburg (2005), Stepanyan (1990), Stuart Baker (1932), Svensson *et al.* (1999), Tomek (2002), Vaurie (1959), Verhoeve & Holmes (1999), Wernham *et al.* (2002), White & Bruce (1986), Winkel (1970).

## 44. Turkestan Tit

### *Parus bokharensis*

**French:** Mésange du Turkestan **German:** Turkestanmeise **Spanish:** Carbonero Turquestano

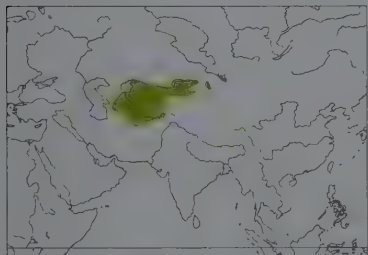
**Taxonomy.** *Parus bokharensis* M. H. C. Lichtenstein, 1823, Bukhara, south Uzbekistan. Part of a species group which includes also *P. major*, *P. monticolus* and *P. nuchalis*. Forms a superspecies with *P. major*; has been treated as conspecific, but the two interbreed only rarely and locally, and genetic evidence indicates that they are better considered separate species. Paler birds from oases in Transcasian deserts sometimes separated as race *panderi*. Three subspecies currently recognized.

#### Subspecies and Distribution.

*P. b. bokharensis* M. H. C. Lichtenstein, 1823 – SC Kazakhstan, Ukbekistan, Turkmenia and extreme NE Iran E to N Afghanistan.

*P. b. turkestanicus* Zarudny & Loudon, 1905 – SE Kazakhstan E to extreme NW China (N Xinjiang), possibly also extreme SW Mongolia.

*P. b. ferghanensis* Buturlin, 1912 – mountains in Tajikistan (Pamir, Alai) and Kyrgyzstan E to W Tien Shan.



**Descriptive notes.** 14.5–15 cm; 16.9–18 g. Large, grey tit with black-and-white face pattern, long tail slightly graduated (outer two feather pairs shorter than central pair). Male nominate race has forehead to crown and crown side (to below eye) and nape glossy bluish-black, large dull whitish nuchal patch; upperparts pale bluish-grey, paler and more sandy in deserts of Transcasia (*“panderi”*), longest uppertail-coverts tipped grey; tail grey with blackish inner webs, outer three rectrices tipped white, outermost almost entirely white (only edge of inner web black); lesser and median upwing-coverts dark grey, edged

pale grey, greater with blackish inner webs and fringed pale grey and broadly tipped white, alula and primary coverts pale grey, largest alula feather finely fringed white; flight-feathers blackish-grey, tertials broadly fringed pale greyish and tipped white, secondaries similar, primaries finely fringed pale greyish-blue; cheek and ear-coverts to nape side white, chin, throat and side of neck to centre of upper breast black, slightly glossed blue on throat and breast; narrow black line from lower bib to vent, rest of underparts creamy white, flanks washed grey, undertail-coverts white with longest tips dark grey; axillaries and underwing-coverts whitish; in worn plumage, crown and nape duller, less glossy, nuchal patch slightly larger, white tips of tail abraded or absent, fringes of wing feathers abraded or absent, bib slightly larger, ventral line slightly broader; iris dark brown; bill black; legs slate-grey. Differs from *P. major* mainly in much greyer appearance, paler underparts, slightly smaller size and smaller bill, longer tail. Female resembles male, but slightly duller black on crown, upperparts duller or tinged browner, bib duller and restricted to centre of upper breast, underparts duller white, dark ventral line narrower and less intensely black. Juvenile is as female, but crown to nape brownish-olive and lacking gloss, nuchal spot tinged yellowish, upperparts tinged olive-green, tips of greater coverts yellowish, cheeks and ear-coverts yellowish (whiter when worn), chin and throat blackish (colour not extending to side of neck), bib reduced to small dark spot in centre of breast, ventral line to only a trace of narrow dark grey down to belly centre, rest of underparts pale yellowish. Racial variation slight: *ferghanensis* differs from nominate in having slightly smaller bill, upperparts slightly paler greyish-blue, flanks washed darker grey, juvenile more visibly yellow on face and underparts; *turkestanicus* is as nominate, but bill slightly larger, upperparts darker (but paler than previous). **VOICE.** All vocalizations very similar to those of *P. major*. Calls include combinations of “pee” or “tink” in short series with other notes, e.g. churring “chrrrr-ich-ich-ich” and a “tchrrrrrrrr” like that of sparrow (*Passer*) as alarm, also with various trills, including mellow “whi-whi-whi-whi”, coarser but strident “chi-chi-chi-chi” and more rapidly delivered “pipipipi”. Song “pid-du, pid-du, pid-du”, rather similar in tone to song of *Periparus ater*, often thinner or more plaintive than that of *P. major*; also a ringing “pink-it, pink-it” and a descending “chee-chee-chee-chee”.

**Habitat.** Throughout much of range occurs in lowland plains and semi-desert areas, usually in riverine woodlands of willows (*Salix*), poplars (*Populus*), including turanga (*Populus euphratica*) groves, tamarisks (*Tamarix*) and saxaul (*Haloxylon*), often with well-developed layer of shrubby vegetation and similar scrub; also in semi-desert oases, orchards and edges of cultivation, parks and gardens. In upland areas occurs in more heavily wooded areas, including conifers, deciduous and mixed woodlands; also in open areas with scattered trees and bushes. To 1550 m in NE Afghanistan, 2000 m in Kazakhstan, and 2135 m in Tien Shan.

**Food and Feeding.** Diet poorly known, but considered to be very similar to that of *P. major*; in addition to small invertebrates and larvae, some seeds. Usually in pairs in breeding season; at other times forms small groups, or occasionally larger groups of up to 100 individuals. Sometimes shy or skulking. Forages at all levels of vegetation, mainly by gleaning.

**Breeding.** Poorly known. Season Apr to late Jun; occasionally two broods. Nest, mostly of animal fur and some plant fibres, placed in hole in tree, wall or side of a building, or in steep earth bank. No other information available.

#### Movements.

Resident.

**Status and Conservation.** Not globally threatened. Locally common; rare in NE Iran, and uncommon in NW China. Status in Mongolia uncertain; further fieldwork required.

**Bibliography.** Cheng Tsohsin (1987), Dementiev *et al.* (1954, 1970), Étiénope & Hùe (1983), Formozov *et al.* (1993), Harrap & Quinn (1996), Hartert (1905, 1921), Hollom *et al.* (1988), Hùe & Étiénope (1970), Johansen (1944), MacKinnon & Phillips (2000), McCarthy (2006), Meyer de Schauensee (1984), Porter *et al.* (1996), Rasmussen & Anderton (2005), Vaurie (1959).

## 45. Green-backed Tit

### *Parus monticolus*

**French:** Mésange montagnarde **German:** Bergkohlmeise **Spanish:** Carbonero Dorsiverde

**Taxonomy.** *Parus monticolus* Vigors, 1831, Simla, Himalayas, north India.

Part of a species group which includes also *P. major*, *P. bokharensis* and *P. nuchalis*. N nominate race and *yunnanensis* intergrade in W Nepal. Four subspecies recognized.

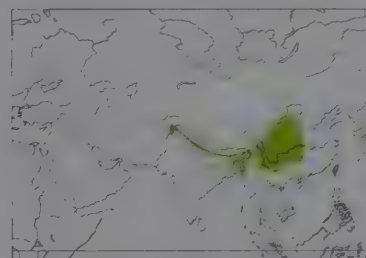
#### Subspecies and Distribution.

*P. m. monticolus* Vigors, 1831 – W & C Himalayas from N Pakistan F to W Nepal and SW China (S Xizang).

*P. m. yunnanensis* La Touche, 1922 – E Himalayas E to NE India (including S Assam), C & S China (S Gansu and S Shaanxi S to S Yunnan and Guizhou), W, N & NE Myanmar, extreme NW Vietnam and C Laos.

*P. m. legendrei* Delacour, 1927 – Langbian, in SC Vietnam.

*P. m. insperatus* Swinhoe, 1866 – Taiwan.



**Descriptive notes.** 12.5–13 cm; 12–16.8 g. Large, black-capped tit with broad black ventral line, greenish upperparts and double wingbar. Male nominate race has forehead to crown (to below eye) and nape glossy bluish, small whitish patch on centre of lower nape; upper edge of mantle yellowish, rest of mantle, and scapulars and upper back bright olive-green, rump light grey, uppertail-coverts blackish, tips of longest bluish-black; tail black, fringed dull violet-blue, all feathers tipped white, outermost rectrix with outer web entirely white and broad white wedge at tip of inner web; lesser upwing-coverts fringed

pale grey, median coverts blackish, finely fringed and tipped white, greater blackish, finely fringed bluish-grey and broadly tipped white, alula and primary coverts black, finely fringed white; flight-feathers sooty black, tertials fringed and broadly tipped white, secondaries and inner primaries finely fringed violet-blue; cheek and ear-coverts to nape side white; chin, throat and side of neck to centre of upper breast black, slightly glossed blue on throat and breast; fairly broad but irregular black line from lower bib to vent; rest of underparts bright lemon-yellow, flanks washed olive, undertail-coverts blackish, broadly tipped white; axillaries and underwing-coverts whitish; in worn plumage, crown and nape duller, less glossy, wing and tail feathers browner, and pale tips of greater coverts and fringes of tertials may be abraded or absent; iris light brown to dark brown; bill black, paler cutting edges of lower mandible; legs slate-grey to blue-grey. Differs from *P. major* mainly in having two wingbars (not one), somewhat brighter green upperparts, bluish edges of flight-feathers. Female is very like male, but has wing and tail browner, fringes of greater coverts, secondaries and primaries duller or greyer, bib duller, more sooty black, and ventral line narrower and less intensely black. Juvenile is as female, but crown to nape browner and lacking gloss, smaller and pale yellowish nuchal spot, upperparts slightly duller, tips of wing-coverts and edges of tertials yellowish, cheeks and ear-coverts pale yellow (whiter with wear), bib reduced to small patch to centre of breast and narrow dark brown ventral line to centre of belly, rest of underparts duller yellow, washed greyish-olive on flanks; juvenile female slightly paler or browner, with slightly deeper yellow wash on tips of greater coverts and tertial edges, and duller or greyer edges of flight-feathers. Racial variation mostly slight: *yunnanensis* is as nominate, but upperparts slightly deeper green, wingbars slightly broader, and underparts brighter yellow with narrower ventral stripe; *insperatus* resembles previous, but tertials fringed bluish, broad white spots at tips of median and greater coverts, and smaller white tips on secondaries; *legendrei* is similar to nominate, but upperparts duller, greyish olive-green, with grey rump, white tips of median coverts narrow and tips of greater slightly broader (less than on previous race), tertials fringed bluish (as previous), breast and belly mostly black (or a much wider ventral line), with yellow paler and restricted to breast side and flanks. **VOICE.** All calls, including range of variation, similar to those of *P. major*, but generally louder or more shrill, and include rapid “fit-schew” and thin “si-si-si-si-li”; flight and contact calls include 3-note “te-te-wheel”; also has a more musical “pling pling pling”, often terminating with “tee-urr”; alarm a 3-note harsh “shick-shick-shick”; in Taiwan (race *insperatus*) a distinctive, rapid and mechanical “heeb t-t-tk, heeb t-t-tk, heeb t-t-tk”, frequently repeated. Song, from early Feb to late May in Nepal and from mid-Apr in Pakistan, a repeated series of disyllabic notes, one note shorter than the other, a rising “seeta-seeta-seeta” recalling a similar phrase given by *Periparus ater*, also “teeye-teeye-teeye” or “tu-weeh, tu-weeh, whi-ee, whi-ee...”; variations include “whicky-whicky, ti-ti-tee-it, tsing-tsing-pi-du, psit-psit-tutu”, also a song of repeated notes on same pitch, “piu-piu-piu...” or “pli-pli-pli-pli”.

**Habitat.** Mainly temperate and subtropical forests, including deciduous forest, principally oak (*Quercus*) and alder (*Alnus*), mixed and coniferous stands, to moist subtropical evergreen forest and higher-altitude birch (*Betula*) and juniper (*Juniperus*); also in undergrowth of bamboo and scrub. In non-breeding season also in forest edge and more open areas of orchards, walnut (*Juglans*) groves, edges of cultivation and gardens. Breeds at 1600–2800 m in W Himalayas and 1200–3660 m in E Himalayas, and 915–2650 m in NE Myanmar; 1980–3650 m in SW China (Xizang) and 1100–3960 m in SC China (Sichuan and Yunnan), 220–500 m in C Laos and 915–1585 m in S Vietnam; 600–2800 m in Taiwan. In non-breeding season also at lower levels, down to 580 m in N Pakistan, to 800 m in foothills in Bhutan and to 315 m in N Myanmar; in SC China (Sichuan) winters at 100–3050 m.

**Food and Feeding.** Diet not well known, but includes small invertebrates and larvae, flower buds, some fruit, including berries, and seeds. Usually in pairs, but in post-breeding season more often in small family groups of up to 20 individuals; also frequently in mixed-species foraging flocks with small babblers (Timaliidae), warblers (Sylviidae) and flycatchers (Muscicapidae), occasionally with *P. major* in W & S China. Generally tame and confiding, in certain areas often enters houses in



villages. Forages actively and acrobatically at all levels in forest trees (though more often in canopy in deciduous trees) and in undergrowth; also searches trunk and branches of trees, and in non-breeding season frequently on the ground. Appears able to withstand deep snowfall and to find food during periods of severe winter weather.

**Breeding.** Season Feb–Jul, but in Taiwan possibly throughout year (most in Mar–Jun); one brood. Nest, built solely by female, a soft pad of grass, plant fibres, moss, animal hair, wool and feathers, placed usually below 3 m, exceptionally to c. 7 m from ground, in hole or cavity in tree trunk, old stump, or fence post, or in hole in rocks or earth bank, sometimes in nestbox or hole in wall, or under eaves of house. Clutch 4–8 eggs; incubation by female, fed on nest by male; chicks fed by both parents. No information on duration of incubation and nestling periods.

**Movements.** Largely resident or short-distance altitudinal migrant. Some spend winter months at very high levels (2680 m in Sikkim, 3900 m in Nepal), but others descend to lower levels of foothills and adjacent plains in Oct–Mar non-breeding season. In N Pakistan, moves lower into Salt Range and Murree Hills and S to Peshawar and Islamabad; in N India occurs in N Punjab and around Dehra Dun (Uttar Pradesh), and farther E makes post-breeding descent into foothills of Bhutan and in N Myanmar; also in China. Vagrant to Ladakh and Bangladesh.

**Status and Conservation.** Not globally threatened. Common or fairly common throughout range; locally abundant.

**Bibliography.** Ali & Ripley (1983), Bates & Lowther (1952), Cheng Tsohsin (1987), Échécopar & Hùe (1983), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmett *et al.* (1998), Harrap & Quinn (1996), Hartert (1905), King *et al.* (1975), MacKinnon & Phillips (2000), Meyer de Schauensee (1984), Rasmussen & Anderson (2005), Roberts (1992), Robson (2000), Smythies (1986), Spierenburg (2005), Stuart Baker (1932), Vaurie (1959).

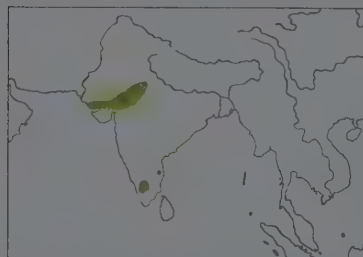
## 46. White-naped Tit

### *Parus nuchalis*

**French:** Mésange à ailes blanches **German:** Weißflügelmeise **Spanish:** Carbonero Nuquiblanco  
**Other common names:** White-winged Black Tit(I), Collared/Pied Tit

**Taxonomy.** *Parus nuchalis* Jerdon, 1845, Eastern Ghats, India.

Part of a species group which also includes *P. major*, *P. bokharensis* and *P. monticolus*. Monotypic.  
**Distribution.** NW & S peninsular India.



**Descriptive notes.** 12–13 cm; 13–14.5 g. Medium-sized, strongly patterned, pied tit. Male has forehead and upper lores to crown, nape and most of upperparts, including all wing-coverts, glossy bluish-black; large or prominent white patch on lower nape and upper mantle; central tail feathers black, narrowly tipped white, outer two pairs (and outer web and tip of next inner) white; flight-feathers black, but tertials largely white (only centres at base black), innermost secondary edged and tipped white, rest of secondaries broadly white at bases, white increasing in extent onto primaries, all secondaries and primaries tipped

white (narrowly on primaries); cheek, ear-coverts and side of neck white or creamy white; chin, throat (narrowly onto throat side) and breast black or glossy bluish-black, broad blackish ventral line extending to lower belly, rest of underparts creamy, or slightly whiter on lower flanks; axillaries and underwing-coverts whitish; iris dark brown; bill black; legs slate-grey. Female differs from male in having slightly duller and less glossy upperparts, nuchal patch smaller, less white on tertials and bases of flight-feathers and white tips restricted to inner feathers, with cheeks and ear-coverts duller, chin yellowish-white, bib and ventral line sooty brown, rest of underparts yellowish. Juvenile is similar to adult, but head and upperparts sooty black and lacking gloss, nuchal patch pale creamy yellow, white on outer tail feathers duller or washed brownish, usually lacks white tips on inner rectrices (all tail feathers more pointed than adult's), has white tips on some (mostly inner) greater coverts, white otherwise restricted to edges of tertials and bases of flight-feathers (usually less on juvenile female), only inner primaries narrowly tipped white; chin to bib and ventral line sooty brown. **VOICE.** Most frequent contact call a short series of thin whistles, usually introduced by slightly higher-pitched note, "ti, pee-pee-pee, ti-pee-pee-pee-pee" or "teep, whee-whee-whee-whee" or "wheh-wheh-wheh-wheh-wheh"; also a soft "tip-it!" and single mellow notes, including "pit" or "chit", and a sharper "tink" similar to that of Common Chaffinch (*Fringilla coelebs*). Song a thin, high-pitched "tiu-sut-sut-sut" and short ringing trill.

**Habitat.** Lowland dry acacia (*Acacia*) thorn-scrub (usually dominated by *Acacia catechu* and *Acacia nilotica*), generally in stony or hilly areas; also dry deciduous forest with scrub, and enters adjacent orchards and gardens. In SW of range, in Kerala, formerly occurred mostly in moist deciduous forests. At 375–920 m in S of range (Karnataka and Tamil Nadu).

**Food and Feeding.** Diet poorly known, but includes small invertebrates, principally spiders (Araneae) and larvae, and also some fruit, especially berries, and nectar. Usually in pairs or in small family parties of up to five individuals; occasionally in mixed-species foraging flocks. Fairly shy or wary. Forages at all levels in trees, but mainly in canopy; also in shrubs and sparse undergrowth.

**Breeding.** Poorly known. Season May–Aug. Nest a pad or platform of plant fibres and down, animal hair and wool, placed up to 2 m above ground in hole in tree, frequently in old hole of woodpecker (Picidae). No information on clutch size, but up to three fledglings recorded in one brood; nestlings fed by both parents. No further information.

**Movements.** Resident, but may disperse some distance from breeding area in non-breeding season.

**Status and Conservation.** VULNERABLE. Has declined considerably in both range and numbers over last century; distribution has probably always been patchy, but local declines and extinctions have exacerbated this tendency; overall numbers now reckoned to be very low. In NW part of range, sparse and sporadic in Kutch and N Gujarat, S & SC Rajasthan; perhaps always rare in S India, but even rarer now with no recent records from Andhra Pradesh and few from Karnataka and Tamil Nadu. In Rajasthan, 8 pairs found in Kumbhalgarh Wildlife Sanctuary and adjacent areas in 2004. Recorded in Anshi National Park (Karnataka) and on border of Mudumalai National Park (Tamil Nadu). Habitat now widely degraded and range fragmented; decline due mainly to depletion and destruction of habitat, largely through clearance for agriculture, fodder, human settlements and urban development, quarrying and gypsum-mining, and overgrazing; also cutting of trees for making charcoal; at one site in Kutch, *Acacia* bushes severely lopped (c. 100 bushes/day) to meet local demand for disposable toothbrushes. Main conservation target is strict protection of a network of patches of healthy habitat. Species largely replaced by *P. major* in areas of increasing urbanization.

**Bibliography.** Ali & Ripley (1983), Anon. (2006f), Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Crosby *et al.* (1994), Grimmett *et al.* (1998), Harrap & Quinn (1996), Hussain *et al.* (1992), Lott & Lott (1999), Rasmussen & Anderson (2005), Sharma (2004), Stattersfield & Capper (2000), Tehsin *et al.* (2005), Tiwari (1997, 2001), Tiwari & Rahmani (1997), Zacharias & Gaston (1993).

## 47. Black-lored Tit

### *Parus xanthogenys*

**French:** Mésange à joues jaunes **German:** Kronenmeise **Spanish:** Carbonero Carigualdo Indio  
**Other common names:** Black-lored Yellow Tit, Black-spotted Tit; Indian Yellow Tit (*aplonotus*)

**Taxonomy.** *Parus xanthogenys* Vigors, 1831, Simla-Almora district, Himalayas, India.

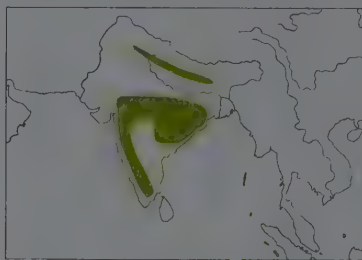
Forms a superspecies with *P. spilnotus*, and has in the past been considered conspecific. Races *aplonotus* and *travancorensis* have been treated as representing one or, alternatively, two separate species; they intergrade in Western Ghats (between Konkani and Hassan), in W of range, where intermediates described as additional race, *xanthonotus* (female with crown varying between black and greenish, or olive-greenish with darker spots, whitish-yellow face and sides of breast and belly contrasting with well-defined bib and ventral stripe). Three subspecies recognized.

**Subspecies and Distribution.**

*P. x. xanthogenys* Vigors, 1831 – NW & C Himalayas from N India E to E Nepal.

*P. x. aplonotus* Blyth, 1847 – C India.

*P. x. travancorensis* (Whistler & Kinnear, 1932) – Western Ghats, in W peninsular India.



**Descriptive notes.** 13–14 cm; 12.9–19.7 g. Medium-sized, crested, black and yellow tit. Male nominate race has forehead and lores to crown and pointed crest black, yellow nape extending upwards onto tips of longest crest feathers; yellowish supercilium (from just before eye) flaring behind eye and merging with yellow on nape, broad black eyestripe merging with black side of neck; upperparts yellowish-green, tinged olive, scapulars with blackish centres, uppertail-coverts greyish; tail blackish, fringed grey, all feathers tipped narrowly white, outer web of outermost rectrix white; upperwing-coverts blackish, median and

greater coverts broadly tipped pale yellowish, alula broadly tipped yellowish-white; flight-feathers blackish-grey, tertials fringed yellowish-white and broadly tipped white, secondaries and inner primaries finely fringed greyish and tipped white, outer primaries broadly white at base (forming small panel on closed wing); cheek, ear-coverts and marginally to upper neck side yellow; chin, throat and side of neck to centre of breast and centre of belly black, slightly glossed blue on throat and breast, sides of breast and belly lemon-yellow, flanks the same or washed olive, and undertail-coverts dark grey, tipped whitish; axillaries and underwing-coverts whitish; in worn plumage, upperparts duller, more grey-green, and dark centres of scapulars larger, cheeks and nuchal patch paler, fringes of flight-feathers reduced, and tips of rectrices abraded; iris dark brown; bill black; legs slaty blue-grey. Differs from *P. spilnotus* in black forehead and lores, longer black eyestripe, more uniformly green (less streaked) upperparts. Female is very like male, but has slightly duller crown and slightly shorter crest, and face and nuchal patch a shade paler yellow. Juvenile is as adult, but crown duller and crest shorter, upperparts duller, becoming greyer on rump and uppertail-coverts, tail with poorly defined whitish tips, wing coverts washed yellow; secondaries fringed grey, cheeks and ear-coverts pale yellow, small bib to centre of breast and ventral line dull brownish-black (paler on juvenile female), rest of underparts pale yellow, washed greyish on flanks, iris paler or greyer. Races fairly well defined: *aplonotus* is as nominate, but blackish on upper lores reaching eye, slightly duller olive-green upperparts, tips of wing-coverts and edges of flight-feathers white, and yellow on face, neck side and underparts somewhat duller or paler, female has paler yellow face and underparts and greyish-olive throat, bib and narrower ventral stripe; *travancorensis* is duller than nominate, dull olive-grey above, rectrices with fine white tips, cheeks pale whitish-yellow, underparts paler yellow and heavily tinged olive, female variable (possibly polymorphic), either as male, or with crown, crest and upperparts olive-grey, face paler or duller than male and eyestripe slightly darker than crown, and throat, bib and ventral stripe olive-grey (on some greenish-olive and little different from rest of underparts, and yellow may be restricted to faint line at side of breast). **VOICE.** Calls include "si-si", "tsi-tsi-pit-tui", "tzee-tzee-wheep-wheep-wheep", also a rattling "ch-chi-chi-chi-chi" like that of a nuthatch (Sitta), and a sharp "tst-reet" alarm note; calls very similar to those of *P. spilnotus*. Song, Jan–Sept in Nepal but mostly Mar and Apr, a series of short disyllabic or trisyllabic musical whistles on different pitches, repeated in quick succession, occasionally louder as e.g. "der-twink, der-twink, der-twink", also as "pui-pui-tee, pui-pui-tee", "tsi-teuw, tsi-teuw" or more strident "tsi-wheeah-wheeah"; in C India, race *aplonotus* song similar to that of nominate, but usually with short and higher-pitched introductory note or series of short, high notes, including "tititit-krak-rak-brzt" and "ti-ti-kit-fzew", also a hard "ti-whit".

**Habitat.** Open submontane and montane subtropical forests, mostly of oak (*Quercus*) or pine (*Pinus*), or evergreen forest; also in mixed bamboo jungle and secondary forest, scrub and scattered trees, ban oak (*Quercus incana*) jungle and wooded edges of cultivation, especially coffee plantations, cardamom sholas, and occasionally gardens. In Himalayas breeds at 850–2400 m, possibly to 2950 m in Nepal, and in peninsular India at 600–1830 m; in non-breeding season, also down to c. 915 m (exceptionally as low as 75 m).

**Food and Feeding.** Food includes small invertebrates and larvae, mainly spiders (Araneae), ants (Formicidae) and cockroaches (Blattodea); also fruit, including mulberries (*Morus*) and raspberries (*Rubus*), also flower buds and nectar. Usually in pairs or in small, probably family, groups; in non-breeding season joins mixed-species foraging flocks with small babblers (Timaliidae), flycatchers (Muscicapidae), minivets (*Pericrocotus*), white-eyes (*Zosterops*), leaf-warblers (*Phylloscopus*) and nuthatches (Sittidae). Actively and acrobatically forages in trees, usually at middle to upper canopy level; rarely descends to undergrowth. Clings upside-down on leaves and slender twigs; occasionally pursues insects, especially flying ants, in flight.

**Breeding.** Season Mar–Jun in Himalayas, in peninsular India Apr–Aug in N, Jul–Oct in S and Jun–Nov in Western Ghats; possibly two broods. Nest built by both sexes, mostly of moss, lichens, plant fibres, wool and animal hair or fur, up to 7 m from ground in natural hole or cavity in tree, occasionally in disused hole of woodpecker (Picidae) or barbet (Capitonidae), or in hole excavated by birds themselves in rotting stump or branch; hole in building or in earth bank also recorded as used. Clutch 4–5 eggs; both parents feed and care for nestlings; no information on incubation and fledging periods.

**Movements.** Resident, with some short-distance altitudinal movements to lower levels in non-breeding season; has occurred in Salt Range, in N Pakistan.



**Status and Conservation.** Not globally threatened. Common or locally common, but absent from large areas of apparently suitable habitat; in Nepal, rare E of Arun Valley. Before 1930s breeding range extended W to Murree Hills, in N Pakistan, but now only a rare winter visitor there.

**Bibliography.** Ali & Ripley (1983), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmett *et al.* (1998), Hailman (1994), Harrap & Quinn (1996), Inskipp & Inskipp (1991), King *et al.* (1975), Martens & Eck (1995), Rasmussen & Anderton (2005), Roberts (1992), Stuart Baker (1932), Vaurie (1950).

## 48. Yellow-cheeked Tit

### *Parus spilonotus*

**French:** Mésange à dos tacheté **German:** Königsmeise **Spanish:** Carbonero Carigualdo Chino  
**Other common names:** Black-spotted Yellow Tit; Chinese Yellow Tit (*rex*)

**Taxonomy.** *Parus spilonotus* Bonaparte 1850, Darjeeling, India.

Forms = superspecies with *P. xanthogenys*, and has in the past been considered conspecific. Races intergrade widely. Four subspecies recognized.

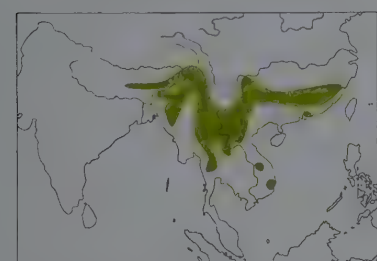
**Subspecies and Distribution.**

*P. s. spilonotus* Bonaparte, 1850 – E Himalayas from E Nepal E to NE India (including N Assam), N & W Myanmar and SW China (S Xizang).

*P. s. subviridis* Blyth, 1855 – NE India (S Assam S to Manipur), Myanmar (except N, W & C), N Thailand and S China (W Yunnan).

*P. s. rex* David, 1874 – S & SE China (S Sichuan and S & E Yunnan E to Fujian and S Zhejiang), N Laos and NW Vietnam.

*P. s. basileus* (Delacour, 1932) – S Laos and SC Vietnam.



**Descriptive notes.** 14–15.5 cm; 18–23 g. Medium-sized to large size tit with erect black crest and eyestripe and yellow cheeks. Male nominate race has forehead and lores to supercilium and nuchal spot yellow, crown and crest to side of nape black, yellow nape extending upwards onto tips of longest crest feathers; broad black eyestripe from eye to rear ear-coverts; upperparts olive-green (greener in NE Myanmar), tinged yellow, with blackish centres of mantle, back and scapular feathers, rump slightly greyish; tail black, fringed bluish-grey, all feathers narrowly tipped white, outer web of outermost feather white; upperwing-coverts

black, median and greater coverts broadly tipped white, alula finely tipped white; flight-feathers blackish-grey, tertials narrowly fringed pale grey and broadly tipped white, secondaries and primaries fringed bluish-grey, outer primaries broadly white at base (forming short panel on closed wing); cheeks, ear-coverts and side of neck yellow; chin, throat (including side of throat) to centre of breast and continuing in irregular line to centre of belly black, slightly glossed blue on throat and breast; sides of breast and belly pale olive, tinged yellowish, flanks the same or greyish-olive, undertail-coverts dark grey, tipped whitish; underwing-coverts blackish, broadly tipped white; in worn plumage, upperparts duller or greyer and dark centres of mantle and scapulars larger, fringes of flight-feathers reduced, white tips of tail abraded, ventral line slightly broader, rest of underparts paler; iris brown; bill dark greyish-horn or black; legs slate-blue to grey. Differs from *P. xanthogenys* mainly in yellow forehead and lores, green mantle streaked blackish, and whitish wingbars. Female differs from male in having wingbars yellowish-white, fringes of flight-feathers olive and bib slightly duller. Juvenile is as adult, but crown duller, crest shorter, face and nuchal patch paler, upperparts duller, becoming greyer on rump and uppertail-coverts, whitish tail tips poorly defined (or absent), upperwing-coverts as adult but duller and tipped yellowish, secondaries fringed grey and tertials fringed olive-grey, cheeks and ear-coverts pale yellow, small dull brownish-black (paler on juvenile female) bib to centre of breast and ventral line to centre of belly, rest of underparts pale yellow, greyish wash on flanks. Racial variation fairly well defined: *subviridis* is as nominate, but slightly darker olive upperparts, dark centres showing as scales, tips of upperwing-coverts white or washed yellowish, neck side and underparts slightly duller or paler, flanks washed greyish-olive, female has more uniform and less scaled mantle, flight-feather edges light olive, bib and ventral stripe olive-yellow or absent; *rex* is as nominate, but male has yellow on head richer, eyestripe broader and blacker, upperparts bluish-grey and broadly streaked blackish, more extensive black below (reaching to side of neck, entire breast and broadly to centre of upper belly), flanks greyish, undertail-coverts whiter, female similar to male but crown duller, upperparts olive-grey and diffusely streaked darker, bib and ventral stripe olive-grey and often little different from rest of underparts; *basileus* is intermediate between previous two, but mantle with variable olive tinge, lacks black on neck side, yellow of face merges with paler or duller yellow on sides of breast, belly whitish, flanks greyish-olive, female similar to that of *rex* but yellower, less grey. VOICE. Calls include “si-si-si” or more drawn-out “si-si-pudi-pudi”, or “tsee-tsee-tsee, si-si” or “ki-ki beer, ki-ki beer, ki-ki beer, ki-ki beer”, and a “witch-a witch-a witch-a”, often in combination with prolonged “churr-r-r-r-r-r” (like similar note of *Cyanistes caeruleus*), also a harsh “krrank-it, krrank-it, krrank-it”; calls generally similar in tone and quality to those of *P. major*. Song a rapid repetition of 3-note, ringing phrase, “chiu-chiu-piu, cha, chiu-chiu-piu, cha, chiu-chiu-piu, cha” or “dzi-dzi-pu, dzi-dzi-pu”.

**Habitat.** Open temperate and subtropical deciduous or mixed forests with oak (*Quercus*), pine (*Pinus*) and rhododendron (*Rhododendron*), also secondary forest, bamboo, edges of (usually well-wooded) cultivation, including plantations and areas with scattered trees; in SE Asia also favours evergreen hill forests and large gardens. In Nepal breeds at 1980–2440 m, in NE India at 1200–2450 m, and in N & E Myanmar at 800–2750 m; in China, above 1000 m in NW Fujian, 1200 m in Sichuan and at 1140–3050 m in Yunnan; breeds at 900–1675 m in Thailand, above 800 m in S Laos and, in Vietnam, at 600–1700 m in NW and 800–2285 m in S. In non-breeding season also at lower levels, down to 450 m in E Nepal, 500 m in Arunachal Pradesh (also up to 3100 m in Oct), and in China down to c. 350 m in Guizhou and N Guangdong, 500 m in N Guangxi, and at 600–700 m in Zhejiang.

**Food and Feeding.** Diet not well known, but includes small invertebrates and larvae, including spiders (Araneae), also buds and some fruit, e.g. berries. Usually in pairs or small family parties; in non-breeding season in mixed-species foraging flocks with other tits and small babblers (Timaliidae). Fairly tame and often confiding, and noisy. Actively forages in middle and lower levels of forest trees, also in shrubs and undergrowth.

**Breeding.** Season late Feb to mid-Aug. Nest a small platform or pad of moss, grass, bracken (*Pteridium*) strips, leaves, animal fur, wool and feathers, sometimes supplemented with other locally available items e.g. flower petals and snakeskin, placed up to 15 m above ground in hole in tree, less frequently in hole in wall or rocky bank. Clutch 4–6 eggs. No further information.

**Movements.** Resident; also short-distance altitudinal migrant, descending to lower levels in non-breeding season.

**Status and Conservation.** Not globally threatened. Common or locally common to rare. Scarce or rare in Himalayas, but locally common in NE Indian hill states and Myanmar. Common in N Thailand; fairly common in N Vietnam, and recently recorded as breeding in E Tonkin (Ha Giang province). In China generally uncommon, but locally common in NW Fujian, N Guangdong and SE Yunnan. Since 1988 range in China has expanded S into Hong Kong, where small population now resident; was previously an irregular non-breeding visitor in Hong Kong.

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Etchécopar & Hüe (1983), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmett *et al.* (1998), Harrap & Quinn (1996), Inskipp & Inskipp (1991), King *et al.* (1975), Lekagul & Round (1991), MacKinnon & Philipps (2000), Meyer de Schauensee (1984), Pui Lok *et al.* (2005), Rasmussen & Anderton (2005), Robson (2000, 2005a), Smythies (1986), Spierenburg (2005), Stuart Baker (1932), Vogel *et al.* (2003).

## 49. Yellow Tit

### *Parus holsti*

**French:** Mésange de Taiwan **German:** Taiwanmeise **Spanish:** Carbonero de Formosa  
**Other common names:** Formosan Yellow Tit

**Taxonomy.** *Parus holsti* Seebohm, 1894, Taiwan.

Molecular studies indicate closest relatives are *P. xanthogenys* and *P. spilonotus*. Monotypic.

**Distribution.** Taiwan.



**Descriptive notes.** 12.5–13 cm. Small tit with long erect crest. Male has forehead, crown and crest to side of nape black, glossed bluish, white nuchal patch extending upwards onto tips of longest crest feathers; upperparts black glossed bluish-green; tail black, broadly fringed blue (variably iridescent to bright pale blue), all feathers narrowly tipped white, outer web of outermost feather white; upperwing black, greater coverts grey or greyish-blue, narrowly tipped white, tertials broadly fringed iridescent blue and broadly tipped white, secondaries and primaries edged iridescent blue, narrow white tips on secondaries; lores

to eye and cheek, ear-coverts and neck side to breast and belly deep yellow, small blackish spot in front of eye, side of lower breast and flanks paler or washed greyish, vent dull black, undertail-coverts yellowish-white; axillaries and underwing-coverts whitish; iris brown or deep reddish-brown; bill black; legs slate-grey to blue-grey. Female is similar to male, but forehead to crest sooty black, glossed bluish, crown side and upperparts to rump dull olive-green, blue fringes on tail duller or greyer, median and greater upperwing-coverts bluish-grey, tipped bright pale grey, edges of flight-feathers slightly duller or greyer, lacks black on vent. Juvenile has forehead to crown and crest bluish-grey, tips of crest whitish, upperparts duller blue and washed olive-green, wing and tail as adult, face pale creamy yellow, underparts white or sometimes washed yellowish. VOICE. Calls include “si-si-si” or more drawn-out and insect-like “tzee-tzee-tzee”, often in combination with other notes e.g. “si-si-si dza-dza-dza” or “tsi-tsu-tsi, tsu-dza-dza-dza” and variations, including “tsut, tsut” and thin buzzing “dzi-dzi-dzi”; alarm a prolonged, scolding “dz-za-za-za”; all calls very similar to those of *P. major*. Song, apparently restricted to breeding season, a series of 3 or 4 ringing notes, mainly variations of “tea-cher” theme, e.g. frequently repeated “tu-wich-chi, tu-wich-chi, tu-wich-chi...” or “pipi-chu, pipi-chu, pipi-chu” or slightly harsher and buzzing “chich-chich-zu, chich-chich-zu, chich-chich-zu”. Female also sings, but song generally less musical than that of male.

**Habitat.** Breeds in temperate primary broadleaf forests, occasionally in mixed and secondary woodlands, usually at 1000–2500 m. In non-breeding season more often along forest edges and occasionally edges of human settlements; recorded down to 700 m.

**Food and Feeding.** Diet poorly known, but includes small invertebrates and larvae; nestlings apparently fed largely with caterpillars. Occurs singly and in pairs; occasionally, joins mixed-species foraging flocks. Forages in upper and canopy levels of forest trees and in tops of shrubs in lower undergrowth.

**Breeding.** Poorly known. Breeds in Apr. at least. Nest mostly of dried leaves, bamboo, lichens, moss and feathers, placed up to 7 m above ground in hole or cavity in tree trunk; nest apparently reused in subsequent years, with new material added. Clutch 3–4 eggs. No further information.

**Movements.** Resident, with some short-distance movements undertaken. Recorded at lower elevations in non-breeding season, but also up to 2500 m at same time of year.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species; present in Taiwan EBA. Uncommon or rare; possibly more numerous in S & W mountains. Has declined as a result of large-scale destruction of broadleaf forest; does not adapt well to more marginal habitats, where meets competition from *P. monticolus*. Is also illegally sought after by bird-trappers for cagebird trade.

**Bibliography.** Anon. (2006), Butchart & Stattersfield (2004), Chung Wuan Fu & Severinghaus (1979), Cheng Tsohsin (1987), Etchécopar & Hüe (1983), Gill *et al.* (2005), Harrap & Quinn (1996), MacKinnon & Philipps (2000), Meyer de Schauensee (1984), Stattersfield & Capper (2000).

## 50. White-fronted Tit

### *Parus semilarvatus*

**French:** Mésange à front blanc **German:** Weißstirnmieise **Spanish:** Carbonero Frentiblanco

**Taxonomy.** *Melaniparus semilarvatus* Salvadori, 1865, Himalayas.; error = Luzon, Philippines. Sometimes placed in a separate genus, *Sittiparus*. Three subspecies recognized.

**Subspecies and Distribution.**

*P. s. snowi* Parkes, 1971 – NE Luzon (N Sierra Madre Mts), in N Philippines.

*P. s. semilarvatus* (Salvadori, 1865) – C & S Luzon (C & S Sierra Madre Mts).

*P. s. nehrkorni* (A. W. H. Blasius, 1890) – Mindanao, in S Philippines.

**Descriptive notes.** 13 cm. Medium-size, large-billed and long-tailed tit with mostly black plumage. Male nominate race has forehead and upper lores white or pale buffish, rest of head, upperparts and underparts blackish-brown, glossed deep indigo-blue above, glossed bluish only on breast below, concealed whitish nuchal patch at base of nape feathers; tail brownish-black, fringed deep blue-black, upperwing brownish-black, median and greater wing-coverts fringed indigo-bluish;





axillaries and underwing-coverts whitish; iris brown to pale brown; bill and legs black. Female is similar to male, but buffish-white on forehead extends diffusely to cheeks, upperparts slightly duller, underparts (lacking gloss except faintly on breast) paler or more ochre-brown, longest undertail-coverts tipped white. Juvenile is as female, young male usually darker or blacker below, and with slightly paler tips of greater coverts. Racial variation slight to moderate: *snowi* male is on average slightly duller, less glossy, above and below, has larger nuchal patch (still concealed, except in juvenile plumage, when appears as narrow

white half-collar), and whiter bases on inner webs of flight-feathers and on undertail-coverts, female slightly duller than nominate, browner on underparts, may show white spots on nape (nuchal patch not always concealed), and usually more white on tips of primary coverts on underwing; *nehrkorni* differs from previous in more extensive white bases on primaries and outer secondaries, axillaries more extensively white, also cheeks and ear-coverts may be whitish, juvenile similar to juvenile of previous, with dull white nuchal patch and more white on undertail-coverts. **VOICE.** Calls include short sharp "psit" and higher-pitched rolling "tsuit" or metallic "zeeeeet", repeated several times or combined into longer "sit-tsuit-suit-suit"; also high-pitched "tsi-tsi-tsi-tsi" or

"zit-zit-zit-zit", sometimes introduced or followed by "tsre" or "tsree", and a longer "tsee-tsi-tsi". Song is apparently a much longer version of call notes accelerating towards end, "tsi-tsi-tsi-tsi-tsi-tsi-tsi-tsi-tsi-tsi"; also gives metallic and rising trill, "i-i-i-i-i, tji", followed by lower "djididididiw".

**Habitat.** Lowland and hill forest, including forest edges, secondary forest and woodlands, degraded and logged forest, also occasionally in scrubby areas; to 1150 m.

**Food and Foraging.** Diet not well known, but presumed to include small invertebrates and larvae. Usually alone, in pairs or in groups of up to ten individuals, also in mixed-species foraging flocks. Shy and elusive. Forages in middle and upper levels of trees, moving from one canopy to the next; also occasionally in undergrowth. Uses fairly rapid gleaning action.

**Breeding.** Very poorly known. Pair prospecting nest-hole in tree stump in early Feb, adult feeding fledged juvenile mid-Mar, and adult in breeding condition in May. No other information.

**Movements.** Resident.

**Status and Conservation.** Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Luzon EBA and Mindanao and the Eastern Visayas EBA. Generally rare or uncommon; locally common in Sierra Madre, in N Luzon. Very few recent observations from Mindanao (race *nehrkorni*), where known from eight localities. Rapid and large-scale destruction of forests in recent years in Philippines has seriously reduced the amount of suitable habitat available to this little-known and generally shy and retiring species.

**Bibliography.** Anon. (2006f), Butchart & Stattersfield (2004), Collar *et al.* (1999), Dickinson *et al.* (1991), Gilliard (1950), Hachisuka (1930), Harrap & Quinn (1996), Kennedy *et al.* (2000), Parkes (1971), duPont (1971), Stattersfield & Capper (2000), Worcester & Bourns (1898).







PLATE 56

inches 3  
cm 8

## Family PARIDAE (TITS AND CHICKADEES) SPECIES ACCOUNTS

### Genus *PSEUDOPODOCES*

Zarudny & Loudon, 1902

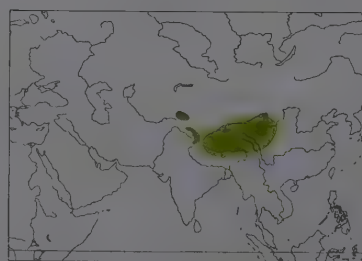
#### 51. Ground Tit

##### *Pseudopodoces humilis*

**French:** Mésange de Hume **German:** Tibetmeise **Spanish:** Carbonero Terrestre  
**Other common names:** Groundpecker, Hume's Groundpecker/Ground Chough/Ground Jay, Brown Ground Chough, Tibetan Ground Jay

**Taxonomy.** *Podoces humilis* Hume, 1871, Sanju Pass, Xinjiang, north-west China. Until recently placed with the crows in family Corvidae, often in the ground-jay genus *Podoces*; osteological, morphological and vocal characters, however, indicate that it belongs in present family, a treatment supported by mitochondrial DNA evidence. E birds sometimes separated as race *saxicola*. Monotypic.

**Distribution.** SW & C China (SW Xinjiang and S & E Qinghai-Xizang Plateau E to Ningxia and Gansu, S to S & SE Xizang, NE Yunnan and W Sichuan), also SE Ladakh, N Nepal and Sikkim.



**Descriptive notes.** 19–20 cm; 42.5–48.5 g. Large, upright, long-feathered or fluffy-looking terrestrial tit with long, curved bill. Forehead pale buff, crown and upperparts grey-brown, tinged sandy, slightly paler on side of crown and rump; broad whitish-buff half-collar on lower nape; central tail feathers dark brown, outermost two pairs buffish-white; upperwing slightly browner than upperparts, alula black, broadly tipped white; primary coverts and flight-feathers dark brown, broadly fringed pale buffish-brown; lores black, cheek and ear-coverts sandy buff; throat and underparts off-white, warm buff tinge on throat to breast side; iris dark brown; bill and legs black. Sexes alike. Juvenile is similar to adult, but upperparts more buffish, paler collar on nape, lacks black on lores and is faintly mottled on face, barred on throat, bill straight and shorter, legs paler. Voice. Usually silent. Call a weak or soft, drawn-out "cheep" and shorter "chip"; clear, downslurred "cheer" or "sque" frequently repeated, also a ringing "veet"



and a strident "scree-sich-ich". Song appears to be a longer version of call, usually introduced with "chip" note before running into rapidly whistled but fairly hoarse scolding "cheep-cheep-cheep-cheep", rising and then falling in pitch.

**Habitat.** Treeless steppes, including grassy plains and rocky hills with scattered stunted bushes above tree-line, often in yak pastures and close to human settlements, including monasteries. At 3100–5500 m in SW China, 4200–5500 m in Ladakh and 3965–5335 m in Nepal Himalayas.

**Food and Feeding.** Diet largely unknown; presumably includes small invertebrates and larvae. Usually solitary or in pairs; occasionally in small groups, possibly family parties. Spends most time on ground, occasionally perches on rocks or walls; usual gait is long bounding hops. Probes in soft earth, turf, yak dung and decaying animal corpses. Flight weak or fluttering and low over ground (but may fly for some distance); evades predators by hopping. Frequently associates with pikas (*Ochotona*).

**Breeding.** Poorly known. Season Apr–Jul. Co-operative breeder. Nest mostly of moss, dry plant fibres and animal hair, placed in deep hole or tunnel (up to 2 m long) in soft ground, bank or stone wall, either excavates own hole or utilizes that of a pika. Clutch 4–6 eggs; nestling period thought to be up to 25 days; well-developed young beg food from adults for some time after fledging. No other information.

**Movements.** Resident, but birds in Ladakh may be scarce residents or occasional summer breeding visitors, Mar–Oct.

**Status and Conservation.** Not globally threatened. Locally common in China; frequent in Nepal and rare in Ladakh.

**Bibliography.** Borecky (1978), Cheng Tsohsin (1987), Étiéhenkopar & Hile (1983), Gebauer *et al.* (2004), Gill *et al.* (2005), Grimmett *et al.* (1998), Harrap & Quinn (1996), Hartert (1903c), James *et al.* (2003), Johannessen *et al.* (2006), Lei Fumin *et al.* (2003), Londei (1998, 2002), MacKinnon & Phillips (2000), Madge & Burn (1993), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (1994), Vaurie (1954a), Wang Gang *et al.* (2003).

## Genus *CYANISTES* Kaup, 1829

### 52. Common Blue Tit

#### *Cyanistes caeruleus*

**French:** Mésange bleue **German:** Blaumeise **Spanish:** Herrillo Común  
**Other common names:** Blue Tit; African Blue Tit (*ultramarinus* and *cyrenaicae*, often with *C. teneriffae*); Pleske's Tit (hybrid form "*pleskii*")

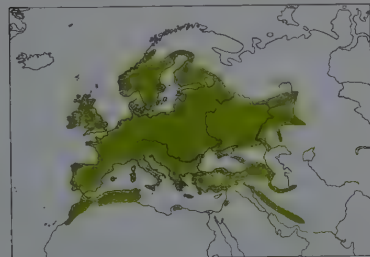
**Taxonomy.** *Parus caeruleus* Linnaeus, 1758, Sweden.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *C. teneriffae* and *C. cyanus*. Previously considered conspecific with former, but differs in mitochondrial DNA; alternatively, races *ultramarinus* and *cyrenaicae* alone frequently treated within *C. teneriffae*; further study required. Hybridizes with *C. cyanus*, especially following years when latter expands W in irruptive manner (hybrids described as a separate taxon, "*pleskii*"); hybridizes rarely also with *Parus major*. Nominote race intergrades with *obscurus*, *ogliastrae* and *satunini*; also, *satunini* intergrades with *persicus*, and it is uncertain which of these races breeds in NW Syria. Eleven subspecies recognized.

**Subspecies and Distribution.**

- C. c. obscurus* (Prazák, 1894) – British Is.
- C. c. caeruleus* (Linnaeus, 1758) – N, C & E Europe (S to N Spain, Italy, N & C Greece), W & N Asia Minor.
- C. c. ogliastrae* (E. J. O. Hartert, 1905) – S Iberia, Corsica and Sardinia.
- C. c. balearicus* (Jordans, 1913) – Mallorca.
- C. c. calamensis* (Parrot, 1908) – S Greece, Cyclades, Crete and Rhodes.
- C. c. orientalis* Zarudny & Loudon, 1905 – SE European Russia.
- C. c. satunini* Zarudny, 1908 – Crimea, Caucasus, E Turkey, N Jordan, NW Iran, possibly also SE Turkey, NW Syria and N Iraq.
- C. c. raddei* (Zarudny, 1908) – N Iran.
- C. c. persicus* (Blanford, 1873) – SW Iran.
- C. c. ultramarinus* (Bonaparte, 1841) – NW Africa from Morocco E to N Tunisia.
- C. c. cyrenaicae* (E. J. O. Hartert, 1922) – NE Libya.

**Descriptive notes.** 11–12 cm; 7.5–14.7 g. Small, small-billed, compact tit with rounded head shape. Male nominate race has forehead and upper lores white and merging with white supercilia, which join on centre of nape; forecrown blue, becoming deeper blue on hindcrown; lores and eyestripe narrowly blackish, merging with deep blue on lower nape and side of neck; centre of lower nape and upper mantle pale greyish-blue, rest of mantle, back and scapulars bluish-green, rump lighter, more yellowish-green, uppertail-coverts bright blue; tail blackish-blue, broadly fringed bright blue, outermost rectrix narrowly fringed whitish;



upperwing-coverts and alula greyish, broadly fringed deep blue, greater coverts tipped white (forming narrow wingbar), flight-feathers dark grey, broadly fringed bright blue, tertials broadly tipped whitish; cheek and ear-coverts white; chin and upper throat black, merging narrowly across throat side with deep blue on lower side of neck; underparts yellow, tinged greenish-olive on breast, brighter yellow on flanks, centre of breast may show narrow blackish line (often concealed), and centre of belly may be whitish; undertail-coverts creamy; axillaries and underwing-coverts yellow; in worn plumage, slightly bluer on crown, flight-feathers and tail, upperparts greyer or less green, white tips of greater coverts and flight-feathers abraded or absent, bib slightly darker black, and blackish line on centre of breast often more prominent; iris dark brown to blackish-brown; bill dark slate to black, paler cutting edges; legs slaty to blue or slate-grey. Female is on average slightly

duller than male, but otherwise very similar. Juvenile has forehead, supercilium and centre of nape dull yellow, crown and neck side darker, upperparts greyer, tail duller blue, upperwing-coverts fringed with greenish-blue, tips of greater coverts and tertials yellowish-white, flight-feathers edged greyish-blue, face and underparts dull yellow (becoming whiter with age), grey on chin and upper throat, and no dark central line on breast. Races differ mainly in colour tones, both above and below; *obscurus* is as nominate, but crown slightly darker blue, mantle slightly darker or greener (less bluish-grey), white tips on greater coverts and tertials slightly narrower, underparts deeper yellow with usually obvious narrow line on central breast; *ogliastrae* is similar to previous, but mantle slightly bluer, wing-coverts deeper blue, underparts bright yellow, female often as brightly coloured as male; *balearicus* is as nominate, but mantle paler or greyer, underparts slightly paler, whiter on breast and belly, line on centre of breast narrower; *calamensis* is very like nominate but slightly smaller; *orientalis* is as nominate, but upperparts olive-grey, tinged yellowish, and underparts brighter or paler yellow; *satunini* is also as nominate, but upperparts slightly darker, olive-grey, underparts pale yellow, flanks greyish; *raddei* is as last, but upperparts slightly darker olive (and less grey), underparts deep yellow; *persicus* has shorter and thinner bill, upperparts pale bluish-green, tinged greyish, underparts variable, from rich yellow on breast and whiter on belly and undertail-coverts to uniform whitish-yellow; *ultramarinus* resembles nominate, but crown black with glossy dark bluish tips, broad black eyestripe (narrow across lores) merging broadly on side of nape with black of hindneck, upperparts mostly dark bluish-grey (rump may be tinged greenish), tertials and secondaries broadly tipped white, lower neck side, chin and upper throat broadly black, underparts deep yellow with pronounced blackish ventral line; *cyrenaicae* is as last but slightly smaller, and has narrower white band on forehead, darker or duller blue mantle, slightly duller yellow underparts. **VOICE.** Very vocal. Contact note between partners or members of flock (frequently used throughout year) a short and thin "tsee", singly or in series; scolding or churring "churrurr", rising towards end, with varying emphasis, given especially in alarm or at approach of predator, may be preceded or followed by single or multiple sharp "tsee" or thin, high-pitched "seeee" or "pit" notes, e.g. "pit pit churr" or "drrrrrrr tit tit tit", and frequently repeated when agitated; in N Africa also sharp calls similar to song of European birds, "tsee-tsi-brree tsee-tsi-brree" or "chi-chichiwee" and a more metallic "pichoo". Also high-pitched "zeedle" by both sexes during courtship and copulation; female on nest also gives short, explosive hissing note in aggressive defence display to intruder or predator; nestlings and recently fledged birds high-pitched and almost incessant "tsee-tsee-tsee-tsee-tsee-tsee". Song a clear, high-pitched and lilting "tsit-sit-sissiwit" or "tsee-tsee-tsee-tsu-tsuühühühühühü" or "psi-psi-tsatsata, psi-psi-tsatsata", frequently repeated after short pauses, also shorter variations, including "tsee-tsee see-see", "siss-seedo" or "psi-dada, psi-dada, psi-dada"; individual males have repertoire of 3–8 songs, and song of female similar to male's. Geographical variation not marked within Europe, but songs in Europe differ from those in NW Africa; race *ultramarinus* has song closer to that of *Parus major*, with series of disyllabic metallic "tizi" notes (songs on Corsica and Mallorca somewhat similar).

**Habitat.** In Europe, mostly lowland and submontane deciduous woodlands, principally containing oak (*Quercus*) and birch (*Betula*), and broadleaf evergreen woods, also thickets, copses, hedgerows, areas of scrub with scattered trees, edges of cultivation, orchards, parks and gardens, including suburban areas and city centres; generally avoids large stands of conifers, although occurs in mature conifers in non-breeding season when in mixed flock. In E Mediterranean, occurs in high-altitude pine (*Pinus*) and oak in Jordan, cedar (*Cedrus*) forest in NW Syria and montane oak woodlands in Iran; in more arid areas in SE parts of range occurs mainly in riverine woodland, parks and gardens. In N Africa in cork oak (*Quercus suber*) forest and in Atlas oak (*Quercus faginea*) and evergreen oak (*Quercus ilex*), also cedar and montane juniper (*Juniperus*) forests in Morocco and N Libya; farther S, resident in palm groves of Saharan oases. In non-breeding season generally found in wider range of habitats containing trees and shrubs, but also in reedbeds. Sea-level to mountains: in breeding season to 1540 m in Austrian Alps, to 1700 m in Switzerland (most breeding below 1250 m), to 1800 m in Pyrenees, to 1525 m in Greece, Turkey and NW Iran (exceptionally up to 2000 m in Greece), and to at least 2040 m in SW Iran; in Caucasus breeds up to tree-line at c. 3500 m; to 1800 m or higher in Morocco.

**Food and Feeding.** Food includes small (usually c. 1 cm) invertebrates and larvae, also some fruit and seeds. Animal items principally springtails (Collembola), grasshoppers (Orthoptera), damselflies (Odonata), earwigs (Dermaptera), bugs (Hemiptera), moths (Lepidoptera, especially of family Tortricidae), lacewings (Neuroptera), spiders (Araneae), flies (Diptera), woodlice (Isopoda), ants (Formicidae), beetles (Coleoptera), harvestmen (Opiliones), millipedes (Diplopoda), slugs and snails (Gastropoda), ticks (Acari). Fruit and seeds, taken mainly in non-breeding season, include those of pine, cypress (*Chamaecyparis*), spruce (*Picea*), yew (*Taxus*), ash (*Fraxinus*), birch, beech (*Fagus*), box (*Buxus*), sycamore and maple (*Acer*), chestnut (*Castanea*), oak, olive (*Olea*), mulberry (*Morus*), fig (*Ficus*), mistletoe (*Viscum*), blackberry (*Rubus*), currant (*Ribes*), plums and cherries (*Prunus*), apple (*Malus*), pear (*Pyrus*), elder (*Sambucus*), rose (*Rosa*), hawthorn (*Crataegus*), dogwood (*Cornus*), snowberry (*Symphoricarpos*), walnut (*Juglans*), honeysuckle (*Lonicera*), sea-buckthorn (*Hippophae*), privet (*Ligustrum*), nightshade (*Solanum*), knapweed (*Centaurea*); also takes sap of birch, sycamore, maple, poplar (*Populus*), walnut and vine, and nectar from flowers of willow (*Salix*), plum, cherry, currant, aloe (*Aloe*), *Hibiscus* and *Tecomaria* in spring. Details of diet determined largely by seasonal abundance of various items. Solitary, in pairs or, in autumn, in small family groups; in autumn and winter sometimes in larger flocks, e.g. in SE of range flocks containing several hundred individuals recorded; also in mixed-species flocks in non-breeding season. Partners usually remain close to breeding territory during non-breeding season and forage with other insectivorous species, including Long-tailed Tit (*Aegithalos caudatus*), Goldcrest (*Regulus regulus*) and Eurasian Treecreeper (*Certhia familiaris*), in roving flock, range of which (up to 10 ha) includes several breeding territories. Winter flocks gradually reduced in size towards end of winter as pairs re-establish breeding territories. Active, agile and restless. Forages at all levels in trees, bushes and shrubs, occasionally on ground but usually only very briefly. Examines leaves, buds and slim branches with great thoroughness (may spend up to 30 minutes in single tree), but in winter often moves rapidly through foliage when foraging. Frequently hangs by one leg from slender twigs or leaves; easily locates insects under loose bark (which it strips) or in leafmines or galls; gleans foliage, feeds on aphids (Aphidoidea) gathered on bushes; taps reeds to locate concealed larvae. Hovers briefly while inspecting foliage, and occasionally pursues insects in flight. Visits birdtables and feeders, where it takes household scraps, including bread, cheese, fat, peanuts and variety of seeds, especially of sunflowers (*Helianthus*); large seeds taken to nearby branch, where opened while held in foot or wedged in bark and hammered with rapid strikes of the bill. Well known in parts of range (e.g. Britain) for its habit of piercing milk-bottle tops on doorsteps in order to sip cream; in more extreme cases, has been known to peck at and remove fresh putty from windows.



**Breeding.** Season Apr to late Jun, with egg-laying, clutch size and breeding success closely linked to timing of emergence and abundance of caterpillars (principally of *Tortrix* moths); two broods frequent in parts of Europe, but rare Britain, Germany, Corsica and Morocco. Monogamous, but polygamous males not infrequent where breeding density high; pair-bond usually lifelong. Territorial and solitary breeder; territory usually well defined by early Feb, and defended against interlopers, but pairs sometimes nest in close proximity, including case of two pairs in same nestbox; all females mated to polygamous male nest within single territory, and male feeds young in all nests. Male display includes slow moth-like flights and glides towards perched female, interspersed with intervals when crest partly raised and tail spread; male may also make vertical flight up to at least 6 m, then dive vertically to low branch; he also dances with body horizontal, tail fanned and slightly raised, nape feathers raised (showing dark blue collar), wings spread but tips drooped, and hops towards nest-site by pivoting along branch for up to 5 m before flying back and repeating the display; courtship of female involves provision by male of high-protein food items through egg-laying and incubation periods. Nest, built by female, mostly a cup of moss, dried grass, fine bark strips, plant fibres, leaves, animal hair and feathers, placed in hole or cleft in tree, or hole in post (including metal signpost) or other artificial site, e.g. wall, occasionally in old nest of other bird (or in foundations of large disused nest), rarely in hole in ground; nestboxes widely used; territory size usually within 1 ha, often much smaller, down to 0.16 ha. Clutch size varies geographically, altitudinally, with size of nest-cavity and quality of surrounding habitat, in Europe 7–13 eggs (clutches with in excess of 18 eggs generally the product of two females), in E of range generally 6–8 eggs; incubation by female, fed at nest by male, period 12–16 days; chicks fed by both parents, nesting period 16–23 days. Breeding success variable, influenced mostly by weather and predation, all following data from studies based on populations in nestboxes: in S England (Oxfordshire), 90–95% of young fledged in first three years, but success drastically reduced in following years through predation by weasel (*Mustela nivalis*); at second study site in S England, 33–77% of nests produced fledged young in different years and success affected mainly by grey squirrel (*Sciurus carolinensis*), weasels, rodents and Great Spotted Woodpecker (*Dendrocopos major*), and in some cases breeding pairs evicted by Tree Sparrows (*Passer montanus*); in Britain, success highest in gardens (86%), in Scots pine (*Pinus sylvestris*) plantations (71%) and in areas free from predation e.g. I of Rhum, in W Scotland (88%); nestling mortality rate affected by extent of rainfall, sudden drop in temperature, and availability of food, late-hatching young often poorly developed and suffer higher mortality. Juvenile mortality rate high in first three months of life, c. 70% between fledging and Nov. Breeds in first year. Estimated c. 75% of breeding pairs survive to following season (and some have remained together for 4 successive years); suburban pairs generally less productive, this attributed to lower nutritional value of available food. Maximum recorded longevity 12 years 4 months.

**Movements.** Mainly resident in C & S of range, partially migratory in N; also some seasonal altitudinal shifts. Evidence from ringing in Britain is that most movements are of 2–28 km (95% of recoveries within 10 km of ringing site, females moving farther than males), and none beyond 100 km; birds from higher altitudes of N Scotland make post-breeding descent to lower valleys. Elsewhere in Europe, N populations (juveniles and adult females) more regularly move S & W in Sept to late Oct to non-breeding grounds in NC Europe and S to around Mediterranean, arriving late Oct and present to mid-Mar in S Greece and mid-Nov to late Feb in Lebanon; rarely farther S, e.g. vagrant in NE Syria and Israel. Numbers recorded on passage at watchpoints vary annually, frequently in low thousands through passes in French Alps, and sometimes very large numbers in Baltic region; occasionally on irruption scale (when overall population at high level), as in autumn 1957, when considerable numbers moved from N & NE range into Baltic area and along S North Sea coast and many arrived on E & S coasts of Britain. Most movements involve first-years, and few adults involved. Longest distances recorded in ringing studies include movements from SE Baltic coast (Kaliningrad) to S Spain (2200 km WSW) and to Venice, in Italy (1260 km SSW), and from Germany to S Spain (1480 km SW).

**Status and Conservation.** Not globally threatened. Common to locally abundant, rare along N edge and in SE of range. Breeds occasionally outside normal limits of range, as e.g. in NE Syria (where otherwise a vagrant). European breeding population estimated at 16,500,000–23,000,000 pairs, most in Spain, British Is and Germany. Breeding densities vary according to habitat, provision of nestboxes and degree of competition from *Parus major*; densities generally highest in oak woodland, where can reach c. 250 pairs/km<sup>2</sup>, and lowest in conifer plantations. Range gradually extended N in 20th century, to S Finland from c. 1900, particularly since mid-1950s (when also increased in Netherlands), and in 1970s expanded into Norway and N Scotland. Population in N Jordan first discovered in 1893, but not seen again until 1984, and breeding first proved in 1990. Appears able successfully to withstand severe winter weather, suffering only some local or short-term fluctuations in numbers; provision of food at birdtables considered to account for considerable portion of winter sustenance enabling large numbers to survive in times of hard or severe weather.

**Bibliography.** Andrews (1995), Barnes (1975), Brown & Grice (2005), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Échécopar & Hûe (1967), Flint *et al.* (1984), Föger & Pegoraro (2004), Fry *et al.* (2000), Gibb (1950, 1954, 1960), Gibbons *et al.* (1993), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Harrop & Quinn (1996), Harrison (1982), Hartert (1905, 1921, 1923), Hollom *et al.* (1988), Hûe & Échécopar (1970), Johansen (1944), Martin (1988), McCarthy (2006), Perrins (1979), Porter *et al.* (1996), Ramadan-Jaradi & Ramadan-Jaradi (1999), Salzburger *et al.* (2002), Snow (1954a), Svensson *et al.* (1999), Vaurie (1957a, 1959), Wernham *et al.* (2002), Winkel (1970).

## 53. Canary Blue Tit

### *Cyanistes teneriffae*

**French:** Mésange des Canaries      **German:** Kanarenmeise      **Spanish:** Herrerillo Canario  
**Other common names:** Tenerife Tit; African Blue Tit (when combined with races *ultramarinus* and *cyrenaicae* of *C. caeruleus*)

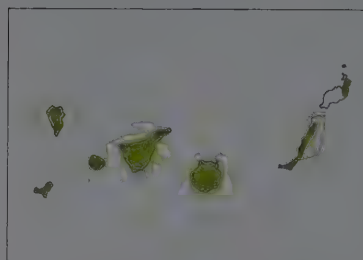
**Taxonomy.** *Parus Teneriffae* Lesson, 1831, Tenerife, Canary Islands.

Until recently present genus normally subsumed into ■ broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *C. caeruleus* and *C. cyanus*. Previously considered conspecific with former, but has isolated island range and differs in mitochondrial DNA; alternatively, races *ultramarinus* and *cyrenaicae* of *C. caeruleus* may be better included in present species; further research required. Four subspecies recognized.

#### **Subspecies and Distribution.**

- C. t. palmensis* (Meade-Waldo, 1889) – La Palma, in NW Canary Is.
- C. t. ombriosus* (Meade-Waldo, 1890) – El Hierro (SW Canaries).
- C. t. teneriffae* (Lesson, 1831) – La Gomera, Tenerife and Gran Canaria, in C Canary Is.
- C. t. degener* (E. J. O. Hartert, 1901) – Lanzarote and Fuerteventura, in E Canary Is.

**Descriptive notes.** 11–12 cm; c. 10 g. Small, sharp-billed, compact tit. Nominate race has forehead and supercilium to centre of nape white, crown deep glossy blue, becoming blackish on hindcrown;



to blackish-brown; bill dark slate to black, paler cutting edges; legs slaty blue to slate-grey. Sexes alike. Juvenile is as adult, but forehead, supercilium and centre of nape yellow, crown and upperparts greenish-blue, rump dull green, tail dull blue, upperwing-coverts and flight-feathers fringed bluish, face and underparts yellow (becoming whiter with age), duller or tinged greyish on breast and belly, usually lacks dark central line on breast. Races differ mainly in colour tones of plumage and prominence of markings: *palmensis* is duller than nominate, lacks gloss on black cap (sootier on female), has broad or prominent supercilium and rather broad blackish eyestripe, upperparts duller or greyer, sometimes tinged green on back and rump, tail narrowly tipped white, narrow white tips on greater upperwing-coverts forming short wingbar, tertiaries and secondaries broadly tipped white, breast and flanks yellow, becoming white on lower breast and belly, and ventral line irregularly dark or absent; *ombriosus* is very similar to nominate but slightly larger, has green on upper mantle, greyish to olive-green on scapulars, narrow greyish-white tips on greater coverts, and darker or richer yellow underparts with short or narrow blackish ventral line; *degener* has black crown, narrower white supercilium and narrower blackish-blue on side of neck to throatband, paler or greyer upperparts, broad white tips of greater coverts and fringes of tertiaries, underparts paler yellow, whiter or lighter yellow belly, blackish ventral line from throat to centre of upper belly. Voice. Song of nominate race a variable repetition of one note or series of notes, ■ powerful, musical “chi-chi-chirichi-chichi” and a less melodic “chi-iss-chi-chi” or “iss-chichichiuu”, also a lively “chivichi-chivichi” and a musical “chillu-chillu-chi”; alarm a loud, vibrant, scolding “cher-er-er-er-g”, sometimes introduced with shorter “chi” or “chi-chi-chivichi”. On La Palma, race *palmensis* voice unlike that of any of other races (and more like that of *Parus major*), song a distinctive “tsa-zachuz”, sometimes with stuttering “er-er-r” introduction, also gives nasal “chié-chié-chié-chié-chié” and “chiff-chichichi”; calls include jangling “tchee tchee” and high-pitched wheezing “see chippi chippi”, alarm a harsh or grating “tcher-tcher-cher-cher-cher”. Race *ombriosus* alarm call and song similar to those of nominate, but song more rapidly twittering and prolonged. Race *degener* sings a distinctive “chii-er-er chii-er-er chii-er-er”, and calls similar to those of both nominate and *ombriosus* but louder.

**Habitat.** On arid islands of Fuerteventura and Lanzarote, breeds mostly in low-lying mixed tamarisk-palm (*Tamarix-Phoenix*) scrub-woodland and well-developed vegetation in grassy areas; elsewhere in variety of wooded habitats, from laurel (Lauraceae) woodland, tree-heath, wooded gulleys (barrancos), euphorbia scrub and parks and gardens (particularly those with fruit trees) to montane pine (*Pinus*, especially *P. canariensis*) forests, to c. 1300 m on Gran Canaria and to 1800 m on Tenerife. On La Palma (*palmensis*) apparently restricted to pine forest, and only occasionally found in adjacent undergrowth or laurel.

**Food and Feeding.** Details not well known; diet possibly not significantly different from that of *C. caeruleus*, except that it may take a larger number of small butterflies (Lepidoptera), aphids (Aphidoidea) and small beetles (Coleoptera). Usually in pairs, solitary, or in small (possibly family) groups; tame and often approachable. Agile, and actively forages at all levels in trees and undergrowth; in non-breeding season forages mainly in palms; frequently hangs upside-down from slender branches and pine cones.

**Breeding.** Season Feb–Jul, possibly also Oct–Jan; usually breeds earlier at lower levels than in montane areas. Nest similar to that of *C. caeruleus*, usually consists of moss, pine needles, leaves and feathers, placed up to 3 m from ground in hole or crevice in tree, wall or rock face, or on ground; also utilizes nestboxes. Clutch 3–6 eggs. No other information.

#### **Movements.** Resident.

**Status and Conservation.** Not assessed. Common on islands of Tenerife and Gran Canaria; scarce or local on Fuerteventura and Lanzarote. Fuerteventura population estimated at 366–1718 individuals in 2001.

**Bibliography.** Bannerman (1963), Clarke (2006), Cramp & Perrins (1993), Échécopar & Hûe (1967), Fry *et al.* (2000), García-del-Rey & Cresswell (2006), Grant (1979), Hagemeijer & Blair (1997), Harrop & Quinn (1996), Hartert (1905), Kvist *et al.* (2005), Lack & Southern (1949), Salzburger *et al.* (2002), Svensson *et al.* (1999), Vaurie (1957a, 1959).

## 54. Azure Tit

### *Cyanistes cyanus*

**French:** Mésange azurée      **German:** Lasurmeise      **Spanish:** Herrerillo Azul  
**Other common names:** Yellow-breasted (Azure) Tit, Turkestan Tit (*carruthersi*, *flavipectus* and *berezowskii*); Pleske's Tit (hybrid form “*pleskii*”)

**Taxonomy.** *Parus cyanus* Pallas, 1770, River Volga, Russia.

Until recently present genus normally subsumed into a broad *Parus*, and many authors still prefer that treatment. Forms a superspecies with *C. caeruleus* and *C. teneriffae*. Hybridizes with former, mainly following years when it expands W in periodic irruptions (hybrids described as a separate taxon, *pleskii*). SC Asian races *carruthersi*, *flavipectus* and *berezowskii* frequently considered to represent a separate species, but *flavipectus* hybridizes with race *tianschanicus* where ranges meet in S Kyrgyzstan; hybridization, however, appears to be limited; further study required. In addition, geographical variation slight and mostly clinal; in particular, race *yenisenseis* intergrades both with *tianschanicus* and with *hyperhipphaeus*. Eight subspecies recognized.

#### **Subspecies and Distribution.**

- C. c. cyanus* (Pallas, 1770) – Belarus and W & C European Russia E to C Urals.
- C. c. hyperhipphaeus* Dementiev & Heptner, 1932 – SW Urals, SW Siberia and N Kazakhstan.
- C. c. yenisenseis* (Buturlin, 1911) – SC Siberia, Altai Mts and N Mongolia E to NE China (Nei Mongol, Manchuria) and Russian Far East.
- C. c. tianschanicus* Menzbier, 1884 – mountains of SE Kazakhstan and adjacent Kyrgyzstan (C & E Tien Shan) E to NW China (N & W Xinjiang).
- C. c. kotalensis* Portenko, 1954 – lowlands of SE Kazakhstan.
- C. c. carruthersi* (E. J. O. Hartert, 1917) – Kyrgyzstan and N Tajikistan (Alai Mts and W Pamirs).

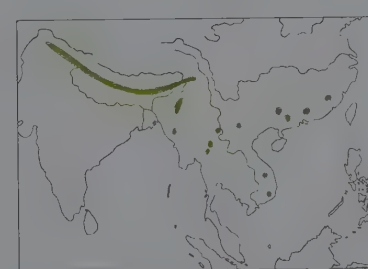


**Breeding.** Season Apr–Jun. Monogamous; territorial. Pair formation in late winter; display by male includes slow gliding flight from branch to branch, wing-shivering and calling, together with lengthy period of courtship feeding. Nest, built by female, mostly a cup of dry grasses, moss, plant down, animal fur and wool, placed 2–4 m from ground in hole or cavity in tree, sometimes among rocks or in hole in building, occasionally in pole (including those carrying urban streetlight). Clutch 7–11 eggs; incubation by female, period 13–14 days; chicks fed by both parents, fledging period c. 16 days. Of 76 eggs (12 clutches) in Kazakhstan study, 28 hatched and 26 hatchlings fledged; of

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Cramp & Perrins (1993), Dementiev *et al.* (1954, 1970), Dolguшин *et al.* (1972), Étchécopar & Hûe (1983), Flint *et al.* (1984), Gill *et al.* (2005), Glutz von Blotzheim & Bauer (1993), Grimmelt *et al.* (1998), Hagemeijer & Blair (1997), Harrap & Quinn (1996), Harrison (1982), Hartert (1905), Hûe & Étchécopar (1970), Johansen (1944), Kovshar (1966), MacKinnon & Philipps (2000), McCarthy (2006), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Rogacheva (1992), Snow (1954a), Stenqvisten (1990), Svensson *et al.* (1999), Vaurie (1950, 1957a, 1959).

**Spanish:** Herrerillo Modesto

*S. m. klossi* Delacour & Jabouille, 1930 – SC Vietnam (Da Lat Plateau).



**Habitat.** Temperate montane and submontane forests, mostly oak (*Quercus*), rhododendron (*Rhododendron*) and mixed forests, at higher level in moss forest with epiphytes and scrub along treeline, but may also occur in willow (*Salix*) thickets and apricot (*Prunus armeniaca*) orchards; in S China also in spruce (*Picea*), fir (*Abies*) and rhododendron forests. Breeds in Himalayas at 2135–3600 m in W and 1980–3350 m in E, above 2350 m in NE Indian hills (Nagaland), and in S China usually at 1500–2800 m or locally higher (perhaps exceptionally to 4270 m in Yunnan), but down to c. 650 m in Fujian; in Myanmar at 2400–3000 m in W (on Mt Victoria) and at 1450–3350 m in N, in NW Thailand 1700–2590 m, and in Vietnam 2000–2800 m in N and 1500–2590 m in S. In non-breeding season also in deciduous and evergreen forests with rhododendron, bushes on hill,



sides and large gardens, often at lower elevations; recorded at 1200–2400 m in W Kashmir, 1500–2800 m in Nepal (exceptionally higher, to 4265 m), at 1525–3400 m in Bhutan and Arunachal Pradesh, and down to 900 m elsewhere in E Himalayas.

**Food and Feeding.** Diet largely unknown, but presumably includes small invertebrates and larvae, also some seeds. Usually solitary or in pairs or small groups in breeding season; in autumn and winter more often in mixed-species foraging flocks with other parids (especially *Parus monticolus*), Black-throated Tits (*Aegithalos concinnus*), various babblers (Timaliidae), Eurasian Treecreepers (*Certhia familiaris*), Goldcrests (*Regulus regulus*) and leaf-warblers (*Phylloscopus*). Fairly inconspicuous, and not often vocal. Forages mostly in middle and upper levels of forest trees and upper levels of taller bushes. Restless, flits about through foliage; agile movements and behaviour, including nervous wing-flicking, reminiscent of those of a leaf-warbler. Also clings acrobatically to twigs and leaves.

**Breeding.** Poorly known. Season at least Apr–May. Nest mostly a pad of moss, with animal hair or fur, placed up to 7 m from ground in natural tree hole or cavity with very narrow entrance (often a thin slit). Clutch 4–6 eggs; chicks fed by both parents, adults may become bold in defence of young. No further information.

**Movements.** Resident and short-distance altitudinal migrant. Post-breeding descent to lower levels in many parts of range.

**Status and Conservation.** Not globally threatened. Common or fairly common in much of range. Uncommon in W Himalayas (E to C Nepal) and uncommon in NW Thailand.

**Bibliography.** Ali & Ripley (1983), Cheng Tsohsin (1987), Etchécopar & Hüe (1983), Fleming (1973), Fleming *et al.* (1979), Gill *et al.* (2005), Grimmer *et al.* (1998), Harrap & Quinn (1996), Hartert (1905, 1921), Inskipp & Inskipp (1991), King *et al.* (1975), Lekagul & Round (1991), Löhrl (1988), MacKinnon & Philipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000, 2005a), Smythies (1986), Spierenburg (2005), Vaurie (1957b, 1959).

## Genus *MELANOCHLORA* Lesson, 1839

### 56. Sultan Tit

#### *Melanochlora sultanea*

**French:** Mésange sultane

**German:** Sultansmeise

**Spanish:** Carbonero Sultán

**Taxonomy.** *Parus sultaneus* Hodgson, 1837, Nepal.

Relationships uncertain; possibly closest to *Sylviparus*. With exception of isolated race *gayeti*, races intergrade widely. Four subspecies recognized.

#### **Subspecies and Distribution.**

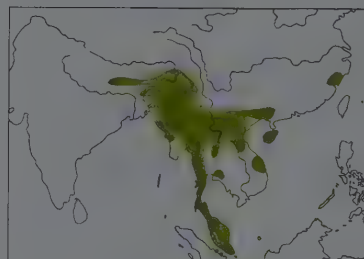
*M. s. sultanea* (Hodgson, 1837) – E Himalayas from C Nepal to NE India (Arunachal Pradesh S to Manipur and Mizoram), Myanmar, N Thailand and S China (W & S Yunnan).

*M. s. flavocristata* (Lafresnaye, 1837) – C & S Thailand, Malay Peninsula and SE China (Hainan I); possibly also Sumatra.

*M. s. seorsa* Bangs, 1924 – N Indochina (S to C Laos) and SE China (Guangxi, Fujian).

*M. s. gayeti* Delacour & Jabouille, 1925 – SC Vietnam (C Annam).

**Descriptive notes.** 20–21 cm; 35–49 g. Largest member of family; strikingly black and yellow, with long bright yellow (or black) floppy crest, long and slightly graduated tail. Male nominate race has forehead, crown and crest bright sulphur-yellow; rest of head, upperparts, including wing and tail, and chin, throat and breast glossy greenish-black, some individuals with outer tail feathers narrowly tipped whitish; underparts below breast, including axillaries and underwing-coverts, bright yellow; iris brown to reddish-brown; bill black or bluish slate-grey; legs blue-grey, sometimes tinged greenish. Female is very like male, but slightly duller or sooty brown, and glossed greenish. Juvenile is as female but lacking gloss, has crest shorter and more rounded, narrow pale



yellow or whitish tips on greater coverts and occasionally primary coverts, underparts duller yellow, young male may show bluish gloss on upperparts from early age. Races differ little: *seorsa* is as nominate, but yellow areas of plumage slightly paler, and may have black shaft streaks in crest; *flavocristata* is as nominate but crest shorter, juvenile has dark shaft streaks in crest and occasionally white tips on tertials and secondaries; *gayeti* is distinctive, has forehead, crown and crest black (not yellow), black upperparts only lightly glossed bluish, female browner and with generally duller greenish gloss. Voice. Generally fairly vocal.

Calls include flat but stony or rattling “chi-dip, tri-trip” or similar metallic “tji-jup”, also a harsh and explosive “krssh-krssh” or slightly longer “krsshup-krsshup”, and a faster and shrill whistled “tria-tria-tria” or “tcheery-tcheery-tcheery”, usually with rising pitch, or harsher “squear-squear-squear”; also utters short and squeaky “whit” or “quit” and louder and ringing “weet”, “vheet” or “zeent-zeent”. Song a series of up to 5 loud, clear and ringing “chew” or “kree” or “piu” whistles, frequently repeated, also as more squeaky “pree-yit, pree-yit, pree-yit”, strident but downslurred “fyu-fyu-fyu-fyu” and rapid, shrill “chit-ter-der chit-ter-der”, likewise repeated several times.

**Habitat.** Edges of lowland and submontane (also lower montane) deciduous, mixed deciduous and evergreen forests, also light forest with bamboo, secondary growth, scrub and edges of cultivation. Breeds mostly below 1220 m in SC China, but occurs to 1370 m in Nepal, 1900 m in Sikkim, 1600 m in Arunachal Pradesh, at 200–2000 m in Bhutan, to 1680 m in N Myanmar, 1000 m in Thailand and 1220 m in Malay Peninsula (but to 1500 m in Cameron Highlands); in C Vietnam, rare below 200 m and frequent at c. 1400 m.

**Food and Feeding.** Diet chiefly small invertebrates and larvae, principally grasshoppers and crickets (Orthoptera), mantises (Mantidae) and spiders (Araneae); also some fruit, mainly berries, also seeds. Usually in pairs and in family groups of up to twelve individuals; also in mixed-species foraging flocks with sibilas and other small babblers (Timaliidae). Forages usually in foliage of upper and canopy levels of trees, when often inconspicuous, but also sits in the open on tops of trees; occasionally also in middle levels or tops of taller undergrowth and bamboo. Active and somewhat acrobatic in foraging motions, but rather more lethargic than other parids, and movements often rather stiff. Flits between branches, and agile when in flight through forest, but in open areas flight fairly fast and bounding. Gleans items from substrate; also hovers briefly on outside of foliage, and occasionally catches insects in flight.

**Breeding.** Poorly known. Season Mar–Jul. Few nests described, composed mostly of grass, green moss, plant down and fibres, leaves and animal hair, placed up to 15 m above ground in hole, crevice or cavity in tree. Clutch 5–7 eggs. No other information.

**Movements.** Resident, with some short-distance dispersal; in NE India, non-breeding visitor in foothills in Nameri National Park, in W Assam.

**Status and Conservation.** Not globally threatened. Fairly common in Bhutan and E Himalayas, and rare in W Himalayas, Nepal and Sikkim; local and uncommon in S China, and on Hainan recorded from only four forest sites; locally common to uncommon in Thailand, and fairly common in C Vietnam; uncommon or scarce throughout most of Myanmar, but locally common in Kachin Hills. Formerly occurred in Bangladesh, but no recent records. Status in Sumatra uncertain, although race *flavocristata* apparently described from there; possibly a rare resident, but known only from a single record of a small party in forest canopy at 100 m in Utara in 1938; 19th-century reports from Sumatra not verifiable, as specimens apparently lost. Population decline recorded in W Himalayas and N India considered directly attributable to habitat destruction.

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46 [*Microeca fascians*], 51 [*Melanodryas cucullata*, *Pachycephala pectoralis*], 52 [*Malurus melanocephalus*], 54 [*Chthonicola sagittatus*, *Pachycephala rufiventris*].

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Mathews (1915). *Austral Avian Rec.* 2(7): 129 [*Gerygone mouki richmondi*].

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- Mearns (1909). *Proc. US Natl. Mus.* **36**: 442 [*Pachycephala philippinensis basilanica*].
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- Meise (1930). *Orn. Monatsber.* **38(1)**: 17 [*Ptilorhoa castanonota par*].
- Meise (1931). *Novit. Zool.* **36(3)**: 353 [*Gerygone mouki amalia*].
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- Meyer, A.B. (1892). *J. Orn.* **40**: 259 [*Ptilorhoa geislerorum*].
- Meyer, A.B. (1893). *Abh. Ber. Mus. Dresden* **4(3)**: 12 [*Tregellasia leucops melanogenys*].
- Meyer, A.B. (1894). *J. Orn.* **42**: 91 [*Pitohui ferrugineus clarus*].
- Meyer, A.B. (1899). *Orn. Monatsber.* **7**: 144 [*Gerygone palpebrosa wahnesi*].
- Meyer, A.B. & Wilesworth (1894). *Abh. Ber. Mus. Dresden* **5(4)**: 1 [*Malia grata recondita*], 2 [*Hylocitrea bonensis*].
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- Meyer de Schauensee (1946). *Notulae Naturae* **169**: 2 [*Parus major templorum*], 8 [*Parus major nubicolus*].
- Meyer de Schauensee (1955). *Auk* **72**: 92 [*Garrulax monileger stuarti*].
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- Neumann (1904). *J. Orn.* **52**: 549 [*Turdoides jardineii emini*].
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- Neumann (1906). *Orn. Monatsber.* **14**: 148 [*Turdoides hypoleuca rufuensis*].
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- North (1901). *Victorian Naturalist* **18(2)**: 29 [*Malurus lamberti assimilis*].
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*monacha lugubris*; 12(22): 344 [Gerygone chrysogaster notata], 345 [Gerygone hypoxantha]; 12(30): 473 [Pitohui kiriocephalus decipiens], 474 [Pitohui ferrugineus holerythrus].

Salvadori (1879). *Ann. Mus. Civ. Storia Nat. Genova Ser. 2, no. 14(14)*: 210 [Alcippe brunneicauda], 224 [Rimator albobristatus, *Turdinus rufipectus*]; 14(15): 227 [Pnoepygia pusilla lepidia], 231 [Mesia argentauris laurinae], 232 [Heterophasia picaoides similima, *Pteruthius flaviscapris cameranoi*]; 15(3): 46 [Pachycephala simplex misomensis], 48 [Pachycephalopsis].

Salvadori (1889). *Ann. Mus. Civ. Storia Nat. Genova Ser. 2, no. 7(23)*: 363 [Paradoxornis nipalensis feae, *Malacias melanoleucus castanopterus*]; 7(26): 410 [Pomatorhinus erythrogenys imberbis].

Salvadori (1890). *Agg. Orn. Papua. Molucche, Part 2*: 104 [Pachycephala meyeri].

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Salvadori (1896). *Ann. Mus. Civ. Storia Nat. Genova Ser. 2, no. 16(7)*: 99 [Sericornis perspicillatus], 102 [Ptilorrhoa leucosticta lorae].

Salvadori (1899). *Boll. Mus. Zool. Anat. Comp. Univ. Torino 14*: 2 [Pachycephalopsis polysoma hypopolia].

Salvadori (1901). *Ann. Mus. Civ. Storia Nat. Genova Ser. 2, no. 20(48)*: 767 [Illadopsis puvelfi].

Salvadori (1903). *Boll. Mus. Zool. Anat. Comp. Univ. Torino 18*: 1 [Illadopsis rufipennis bocagei].

Salvadori (1913). *Ann. Mus. Civ. Storia Nat. Genova Ser. 2, no. 6(1)*: 6 [Dryonastes chinensis propinquus].

Salvadori & D'Albertis (1875). *Ann. Mus. Civ. Storia Nat. Genova Ser. 1, no. 7(52)*: 822 [Pachycephala leucogastra], 827 [Malurus alboscapulatus naimti].

Sarasin, F. (1913). In: Sarasin & Roux, *Nova Caledonia 1(1)*, A. Zool.: 21, plate 2, fig. 16 [Gerygone flavolateralis lifuensis], 22, plate 1, fig. 4 [Gerygone flavolateralis rouxi].

Schlegel (1871). *Ned. Tijdschr. Dierk. 4(3)*: 40 [Monachella muelleriana], 43 [Pachycephala schlegelii], 46 [Pitohui nigrescens], 47 [Melampitta, *Melampitta lugubris*, *Daphoenositta chrysoptera papuensis*].

Schlegel (1880). *Notes Mus. Leyden 2*: 165 [Malia, *Malia grata*].

Schodde (1899). *Canberra Bird Notes 13(4)*: 121 [Cormobates leucophaea metastasis].

Schodde & Christidis (1987). *Emu 87(3)*: 189 [Amytornis barbatus diamantina].

Schodde & Hitchcock (1968). *CSIRO Wildl. Res. Tech. Pap. 13*: 42 [Malurus alboscapulatus kutubui].

Schodde & Mason (1976). *Emu 76(3)*: 113 [Colluricincla megarrhyncha aelptes].

Schodde & Mason (1991). *Emu 91(3)*: 136 [Psophodes nigrogularis oberoni], 138 [Psophodes nigrogularis lashmari].

Schodde & Mason (1999). *Directory Austr. Birds – Passerines*: 94 [Malurus splendens emmottorum], 102 [Stipiturus malachurus pollinotum], 113 [Amytornis striatus rowleyi], 135 [Dasyornis brachypterus monoides], 138 [Dasyornis broadbenti carochrous], 142 [Acanthornis magna greeniana], 145 [Hylacola pyrrhopigia pedleri, *Hylacola pyrrhopigia parkeri*], 148 [Hylacola cauta macrorhyncha], 150 [Calamanthus fuliginosus bourneorum], 177 [Smicronis brevirostris ochrogaster], 202 [Acanthiza apicalis cinerascens], 376 [Microeca flavigaster flavissima], 397 [Orithynx spaldingii melasmenus], 405 [Pomatostomus superciliosus centralis], 418 [Cinclosoma punctatum anachoretia], 420 [Cinclosoma castanotum fordianum], 424 [Cinclosoma cinnamomeum tirariense], 433 [Pachycephala olivacea bathychroa], 434 [Pachycephala olivacea apatetes, *Pachycephala olivacea hesperus*], 455 [Colluricincla megarrhyncha synaptica].

Schodde & Weatherly (1981). *S. Austr. Orn. 28*: 170 [Stipiturus malachurus parimeda].

Schodde & Weatherly (1982). In: Schodde, *Fairy-wrens: Monogr. Maluridae*: 32, plate 3 [Malurus grayi campbelli].

Schouteden (1949). *Rev. Zool. Bot. Afr. 42*: 344 [Kupeornis chapini].

Sclater, P.L. (1853). In: Jardine, *Contrib. Orn. 1852*: 148 [Achaetops pycnopygius].

Sclater, P.L. (1858). *J. Linn. Soc. London (Zool.) 2(8)*: 158 [Crateroscelis murina].

Sclater, P.L. (1874). *Proc. Zool. Soc. London 1873(3)*: 690, plate 52 [Ptilorrhoa leucosticta], 691, plate 53 [Poecilodryas brachyura], 692 [Pachycephala soror, *Alcedryas rufinucha*], 693 [Cormobates placens].

Sclater, P.L. (1883). *Proc. Zool. Soc. London 1883(1)*: 55 [Microeca hemixantha, *Pachycephala arctitorquis*]; 1883(2): 198 [Pachycephala pectoralis fuscoflava], 199 [Gerygone dorsalis].

Sclater, W.L. & Moreau (1935). *Bull. Brit. Orn. Club 56(1)*: 16 [Arcanator orostruthus amani].

Scopoli (1786). *Deliciae Florae Faunae Insubricae, Part 2*: 86 [Dryonastes chinensis], 96 [Leiothrix lutea].

Seebohm (1884). *Ibis Ser. 5, no. 2(3)*: 263 [Pomatorhinus ruficollis syani].

Seebohm (1891). *Ibis Ser. 6, no. 3(1)*: 96 [Pachycephala pectoralis aurantiventris].

Seebohm (1894). *Bull. Brit. Orn. Club 4(2)*: 7 [Parus holsti].

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Serle (1949). *Bull. Brit. Orn. Club 69(6)*: 50 [Kupeornis, *Kupeornis gilberti*].

Serle (1956). *Bull. Brit. Orn. Club 76(2)*: 22 [Illadopsis cleaveri marchanti].

Severtsov (1873). *Vert. Turkest. Zhivotn. 1872*: 133 [Cyanistes cyamus flavipectus], 134 [Periparus ater rufipectus, *Poecile montanus songarus*].

Sharpe (1870). *Ibis Ser. 2, no. 6(4)*: 474 [Illadopsis fulvescens gularis].

Sharpe (1870). *Proc. Zool. Soc. London 1870(2)*: 392, fig. 2 [Mystacornis].

Sharpe (1872). *Ann. Mag. Nat. Hist. Ser. 4, no. 10*: 451 [Illadopsis rufipennis].

Sharpe (1876). *Ibis Ser. 3, no. 6(1)*: 41 [Erpornis zantholeuca brunnescens].

Sharpe (1876). In: Layard & Sharpe, *Birds South Africa*, 2nd edition, Part 3: 213 [Turdoides jardineii kirkii].

Sharpe (1877). *Cat. Birds Brit. Mus. 3*: 285 [Pitohui kiriocephalus aruensis, *Pitohui kiriocephalus tibialis*].

Sharpe (1877). *Trans. Linn. Soc. London (Zool.) Ser. 2, no. 1(6)*: 331 [Macronus gularis woodi, *Macronus striaticeps*], 332, plate 50, fig. 3 [Ptilocichla, *Ptilocichla falcata*], 338, plate 53, fig. 2 [Periparus amabilis].

Sharpe (1878). *J. Linn. Soc. London (Zool.) 13(72)*: 494 [Gerygone olivacea cinerascens].

Sharpe (1879). *Cat. Birds Brit. Mus. 4*: 165 [Petroica boodang leggii], 221 [Gerygone magnirostris brunneipectus], 239 [Heteromyias].

Sharpe (1879). *Notes Mus. Leyden 1*: 29 [Eugerygone rubra], 31 [Chytomyias, *Chytomyias insignis*].

Sharpe (1879). *Proc. Zool. Soc. London 1879(2)*: 248, plate 23 [Rhinocichla treacheri].

Sharpe (1881). *Proc. Zool. Soc. London 1881(3)*: 788 [Malurus cyaneus cinerascens].

Sharpe (1882). *Cat. Birds Brit. Mus. 6* (1881): 304 [Pnoepygia pusilla rufa].

Sharpe (1882). *J. Linn. Soc. London (Zool.) 16(92)*: 318 [Tregellasia leucops albifacies, *Pachycephalopsis polysoma*], 319 [Ptilorrhoa castanonota pulchra]; 16(94): 432 [Sericornis spilodera guttatis].

Sharpe (1883). *Cat. Birds Brit. Mus. 7*: 336 [Cinclosoma castaneothorax marginatum], 390 [Turdoides subrufa hyperythra], 391 [Turdoides rubiginosa heuglini], 434 [Garrulax monileger mouhoti], 449 [Stactocichla], 451 [Melanocichla], 452 [Rhinocichla], 454 [Dryonastes], 486 [Paradoxornis nipalensis humii, *Paradoxornis verreauxi*], 507 [Crateroscelis], 552 [Pellorneum tickelli assamense], 564, plate 13, fig. 2 [Pellorneum pyrogeus erythrote].

Sharpe (1884). *J. Linn. Soc. London (Zool.) 17(103)*: 422 [Phyllanthus atripennis bohndorffi].

Sharpe (1886). *Nature (London) 34*: 340 [Gerygone chloronota cinereiceps].

Sharpe (1887). *Ibis Ser. 5, no. 5(4)*: 447 [Staphida everetti], 448 [Macronus bornensis montanus], 449 [Stachyris nigricipes borneensis], 450 [Pellorneum pyrogenys canicapillus], 451 [Pachycephala hypoxantha].

Sharpe (1887). *Proc. Zool. Soc. London 1887(3)*: 436, plate 37 [Trochalopteron peninsulae], 437 [Pomatorhinus hypoleucus wrayi], 438 [Napothera brevicaudata leucosticta], 439 [Alcippe peracensis], 439, plate 38, fig. 1 [Pseudominla castaneiceps soror].

Sharpe (1888). *Ibis Ser. 5, no. 6(4)*: 389 [Melanocichla calva], 391 [Napothera crassa], 437 [Pitohui kiriocephalus meridionalis], 479 [Garrulax palliatus schistochlamys, *Napothera epilepidota exsul*].

Sharpe (1888). *Proc. Zool. Soc. London 1888(3)*: 273 [Gampsorhynchus torquatus saturator], 276 [Cutia nipalensis cervinocrissa, *Siva cyanouroptera sordidior*].

Sharpe (1892). *Bull. Brit. Orn. Club 1(2)*: 7 [Stachyris nigricipes davisoni].

Sharpe (1892). *Proc. Zool. Soc. London 1892(2)*: 228, plate 20, fig. 2 [Illadopsis fulvescens moloneyana].

Sharpe (1895). *Bull. Brit. Orn. Club 4(9)*: 41 [Turdoides leucopygia smithi].

Sharpe (1898). *Bull. Brit. Orn. Club 8(3)*: 22 [Petroica boodang campbelli].

Sharpe (1900). *Bull. Brit. Orn. Club 11(2)*: 29 [Turdoides hindei].

Sharpe (1900). *Ibis Ser. 7, no. 6*: 341 [Petroica multicolor ambryensis], 343 [Pachycephala pectoralis intacta].

Sharpe (1901). *Bull. Brit. Orn. Club 12(1)*: 2 [Illadopsis cleaveri bitesi].

Sharpe (1902). *Bull. Brit. Orn. Club 13(1)*: 10 [Pseudocalippe atriceps].

Sharpe (1903). *Hand-list Gen. Spec. Birds Nom. Av. 4*: 70 [Paradoxornis atosuperciliaris oatesi], 315 [Eopsaltria flaviventris].

Sharpe (1905). *Bull. Brit. Orn. Club 15(9)*: 96 [Paradoxornis nipalensis ripponi].

Sharpe & Dresser (1871). *Ann. Mag. Nat. Hist. Ser. 4, no. 8*: 437 [Periparus ater britannicus].

Shaw (1790). In: White, *J. Voy. New South Wales*: 239, plate 27 [Eopsaltria australis], 257, plate 42 [Acanthiza pusilla].

Shaw (1794). *Zool. New Holland 1*: 25, plate 9 [Cinclosoma punctatum].

Shaw (1798). *Trans. Linn. Soc. London 4*: 242, plate 21 [Stipiturus malachurus].

Shelley (1874). *Ibis Ser. 3, no. 4(1)*: 89 [Illadopsis cleaveri].

Shelley (1881). *Ibis Ser. 4, no. 5(1)*: 116 [Parus albiventris].

Shelley (1884). *Ibis Ser. 5, no. 2(1)*: 45 [Turdoides squamulata].

Shelley (1885). *Ibis Ser. 5, no. 3(4)*: 404, plate 11, fig. 1 [Turdoides aylmeri], 406, plate 11, fig. 2 [Parus thruppi].

Shelley (1892). *Bull. Brit. Orn. Club 1(2)*: 6 [Parus niger xanthostomus].

Shelley (1900). *Birds Afr. 2*: 229 [Parus guineensis], 238 [Parus rufiventris masukuensis].

Siebers (1929). *Treubia 11*: 150 [Garrulax rufifrons slamatensis].

Sims (1957). *Bull. Brit. Orn. Club 77(9)*: 154 [Malacocincla abbotti altera].

Slater (1885). *Ibis Ser. 5, no. 3(3)*: 327 [Parus major sarawacensis].

Slater (1897). *Ibis Ser. 7, no. 3(2)*: 172, plate 4 [Paradoxornis davidianus].

Smith, A. (1836). *Rep. Exped. Explor. Central Africa*: 45 [Turdoides jardineii].

Snigirewskii (1931). *J. Orn. 79(1)*: 59 [Lophophanes cristatus bashchirikus].

van Someren (1915). *Bull. Brit. Orn. Club 35(9)*: 125 [Illadopsis fulvescens ugandae].

van Someren (1931). *J. East Afr. & Uganda Nat. Hist. Soc. 37* (1930): 196 [Turdoides squamulata jubaensis].

Sparman (1788). *Mus. Carolinianum 3*: no. 69 [Petroica australis].

Steere (1890). *List Birds Mammals Steere Exped.*: 17 [Macronus striaticeps mindanensis, *Sterrhoptilus nigrocapitatus*], 18 [Ptilocichla mindanensis basilanica].

Stejneger (1885). In: Kingsley, *Standard Nat. Hist. 4*: 499 [Amytornis].

Stejneger (1886). *Proc. US Natl. Mus. 9*: 200 [Poecile palustris dresseri].

Stejneger (1892). *Proc. US Natl. Mus. 15*: 342 [Poecile palustris hensoni].

Stepanyan (1974). *Zoologicheskii Zhurnal 53(8)*: 1271 (In English 1272) [Paradoxornis heudei polivanovi].

Stepanyan (1998). *Zoologicheskii Zhurnal 77(5)*: 616 (In English 618) [Strophocincla lineata schachadzei].

Stephens (1817). In: Shaw, *Gen. Zool. 10*: 44 [Poecile cinctus latham].

Stevenson (1940). *Proc. Biol. Soc. Washington 53*: 15 [Baeolophus atricristatus paloduro].

Stresemann (1921). *Anz. Orn. Ges. Bayern 1(5)*: 34 [Sericornis virgatus pontifex, *Sericornis papuensis buergersi*], 36 [Pachycephala hyperythra sepihana, *Colluricincla megarrhyncha mazandrina*].

Stresemann (1922). *J. Orn. 70(3)*: 406 [Pitohui nigrescens buergersi].

Stresemann (1922). *Orn. Monatsber. 30*: 8 [Pitohui kiriocephalus senex].

Stresemann (1923). *J. Orn. 71(2/3)*: 364 [Garrulax monileger melli, *Leiothrix lutea kwangtungensis*], 365 [Pterorhinus davidi concolor], 366 [Schoeniparus brunneus weigoldi].

Stresemann (1929). *J. Orn. 77(2)*: 333 [Pomatorhinus swinhoei abbreviatus, *Minla ignotincta sini*].

Stresemann (1929). *Orn. Monatsber. 37*: 140 [Babax lanceolatus latouchei, *Pteruthius aenobarbus yaoshanensis*].

Stresemann (1930). *Orn. Monatsber. 38*: 47 [Trochalopteron milnei sinianum], 148 [Stachyris melanothorax albigula].

Stresemann (1931). *Orn. Monatsber. 39*: 45 [Trichastoma celebense rufosuscum].

Stresemann (1933). *Orn. Monatsber. 41*: 116 [Pachycephala pectoralis ottomeryi].

Stresemann (1940). In: Stresemann & Heinrich, *Mitt. Zool. Mus. Berlin 24(2)*: 180 [Paradoxornis gularis rarus], 200 [Macronus gularis ticehursti].

Stresemann & Paludan (1932). *Novit. Zool. 38*: 153 [Pachycephala simplex waigewensis], 157 [Poecilodryas hypoleuca steini], 230 [Sericornis virgatus jobiensis].

Stresemann & Paludan (1932). *Orn. Monatsber. 40*: 15 [Crateroscelis murina capitalis], 16 [Sericornis spilodera ferrugineus].

Stresemann & Paludan (1934). *Orn. Monatsber. 42*: 45 [Rhagologus], 46 [Crateroscelis nigrorufa blissi].

Strickland (1844). *Ann. Mag. Nat. Hist. 13*: 417 [Turdinus macrodactylus].

Strickland (1847). *Proc. Zool. Soc. London 1846(14)*, no. 165: 102 [Malacocincla abbotti olivacea].

Strickland (1848). In: Jardine, *Contr. Orn. 1848*: 63(10), plate 12 [Stachyris leucotis].

Strickland (1849). In: Jardine, *Contr. Orn. 1849*: 91(19), plate 30 [Pachycephala pectoralis macrorhyncha], 93(21), plate 31 [Malacocincla malaccensis poliogenys], 127(28), plate 35 [Trichastoma celebense], 128(29), plate 36 [Pellorneum capistratum capistratoides].

Stuart Baker (1914). *Bull. Brit. Orn. Club 35(1)*: 17 [Trochalopteron chrysopterum woodi].

Stuart Baker (1917). *Bull. Brit. Orn. Club 38(1)*: 8 [Sylviparus modestus simlaensis, *Lophophanes dichrous wellsi*], 9 [Pomatorhinus schisticeps klossi], 10 [Stachyridopsis rufifrons obscura].

Stuart Baker (1918). *Bull. Brit. Orn. Club 38(7)*: 64 [Garrulax monileger fuscatus].

Stuart Baker (1920). *Bull. Brit. Orn. Club 41(1)*: 10 [Stachyris herberti], 11 [Schoeniparus rufogularis major].

Stuart Baker (1922). *Fauna Brit. India. Birds*, 2nd edition, 1: 296 [Malacias melanoleucus ruddlei].

Styan (1887). *Ibis Ser. 5, no. 5(2)*: 167, plate 6 [Anthracoceros cineracea cinereiceps].

Styan (1896). *Ibis Ser. 7, no. 2(3)*: 310 [Alcippe morrissona davidi], 312 [Schoeniparus brunneus olivaceus].

Styan (1899). *Bull. Brit. Orn. Club 8(4)*: 26 [Fulvetta cinereiceps fucata].

Sushkin (1904). *Bull. Brit. Orn. Club 14(4)*: 44 [Poecile cinctus sayanus].

Swainson (1830). *Zool. Illustr. (2nd Ser.) 2*, Part 8: plate 36 and text [Petroica].

Swainson (1831). *Zool. Illustr. (2nd Ser.) 2*, Part 17: plate 80 and text [Turdoides reinwardtii].

Swainson (1832). In: Swainson & Richardson, *Fauna Bor.-Amer. 2* (1831): 486 [Chaetops], 487 [Pellorneum, *Pellorneum ruficeps*], 490 [Leiothrix], 491 [Pterithus], 492 [Eopsaltria].

Swainson (1837). *Birds W. Afr. 1*: 274 [Turdoides plebejus platycirca], 278 [Phyllanthus atripennis].

Swainson (1838). *Anim. in Menag.*: 283 [Colluricincla harmonica strigata].

Swinhoe (1859). *J. North China Branch Roy. Asiatic Soc. 1*: 228 [Leucodiptron taewanum, *Pomatorhinus musicus*].

Swinhoe (1861). *Ibis Ser. 1, no. 3(3)*: 265 [Pomatorhinus ruficollis stridulus].

Swinhoe (1863). *Ibis Ser. 2, no. 5(3)*: 296 [Alcippe morrissona].

Swinhoe (1864). *Ibis Ser. 1, no. 6(3/4)*: 361 [Malacias auricularis].

Swinhoe (1866). *Ibis Ser. 2, no. 2(3)*: 300, plate 9 [Paradoxornis webbianus hulomachus], 308 [Parus monticolus insperatus], 310 [Stachyridopsis ruficeps praecognita].

Swinhoe (1867). *Ibis Ser. 2, no. 3(4)*: 403 [Pterorhinus samio].

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